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**REPORT OF THE MARITIME SAFETY COMMITTEE ON ITS NINETY-FIRST SESSION**

Attached are annexes 22 to 40 to the report of the Maritime Safety Committee on its ninety-first session (MSC 91/22).

## LIST OF ANNEXES



**(See document MSC 91/22/Add.1 for annexes 1 to 21)**

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# ANNEX 22

## DRAFT AMENDMENTS TO THE INTERNATIONAL SAFETY MANAGEMENT (ISM) CODE

## PART A – IMPLEMENTATION

### 6 RESOURCES AND PERSONNEL

1 A new paragraph 6.2.1 is inserted after existing paragraph 6.2 as follows:

"6.2.1 The Company should ensure that the ship is appropriately manned in order to encompass all aspects of maintaining safe operations on board*.

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* Refer to the *Principles of minimum safe manning*, adopted by the Organization by resolution A.1047(27))."

### 12 COMPANY VERIFICATION, REVIEW AND EVALUATION

2 The following new paragraph 12.2 is inserted after existing paragraph 12.1 and the following paragraphs are renumbered accordingly:

"12.2 The Company should periodically verify whether all those undertaking delegated ISM-related tasks are acting in conformity with the Company's responsibilities under the Code."

### Footnotes

1 In paragraph 1.1.10, the following footnote is added after the words "Major non-conformity":

"Refer to the Procedures concerning observed ISM Code major non-conformities (MSC/Circ.1059-MEPC/Circ.401), as may be amended."

2 In paragraph 1.2.3.2, the following footnote is added after the word "account":

"Refer to the List of codes, recommendations, guidelines and other safety and security-related non-mandatory instruments (MSC.1/Circ.1371), as amended."

3 The following footnote is added at the end of the title of section 3:

"Refer to the Guidelines for the operational implementation of the International Safety Management (ISM) Code by Companies (MSC-MEPC.7/Circ.5), as amended."

4 The following footnote is added at the end of the title of section 4:

"Refer to the Guidance on the qualifications, training and experience necessary for undertaking the role of the Designated Person under the provisions of the International Safety Management (ISM) Code (MSC MEPC.7/Circ.6), as amended."

5 The following footnote is added at the end of the title of section 8:

"Refer to the *Guidelines for a structure of an integrated system of contingency planning for shipboard emergencies*, adopted by the Organization by resolution A.852(20), as amended."

6 The following footnote is added at the end of the title of section 9:

"Refer to the Guidance on near-miss reporting (MSC-MEPC.7/Circ.7)."

7 The following footnote is added at the end of the title of section 11:

"Refer to the Revised list of certificates and documents required to be carried on board ships (FAL.2/Circ.123, MEPC.1/Circ.769 and MSC.1/Circ.1409), as amended."

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# ANNEX 23

## DRAFT ASSEMBLY RESOLUTION

## REVISED GUIDELINES ON THE IMPLEMENTATION OF THE INTERNATIONAL SAFETY MANAGEMENT (ISM) CODE BY ADMINISTRATIONS

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety and the prevention and control of marine pollution from ships,

RECALLING ALSO resolution A.741(18) by which it adopted the *International Management Code for the Safe Operation of Ships and for Pollution Prevention (International Safety Management (ISM) Code)*,

RECALLING FURTHER resolution A.788(19) by which it adopted the *Guidelines on implementation of the International Safety Management (ISM) Code by Administrations*,

NOTING that the ISM Code became mandatory, under the provisions of chapter IX of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, for Companies operating certain types of ships, on 1 July 1998; and for Companies operating other cargo ships and mobile offshore drilling units propelled by mechanical means of 500 gross tonnage and upwards, on 1 July 2002,

NOTING ALSO resolution A.1022(26) by which it adopted the *Guidelines on implementation of the International Safety Management (ISM) Code by Administrations*,

NOTING FURTHER that the Maritime Safety Committee, at its [ninety-second session], adopted, by resolution MSC.[…(92)], the amendments to the ISM Code,

RECOGNIZING that an Administration, in establishing that safety standards are being maintained, has a responsibility to ensure that Documents of Compliance and Safety Management Certificates have been issued in accordance with the ISM Code taking into account the aforementioned Guidelines,

RECOGNIZING ALSO that there may be a need for Administrations to enter into agreements in respect of the issue of certificates by other Administrations in compliance with chapter IX of the 1974 SOLAS Convention and in accordance with resolution A.741(18),

RECOGNIZING FURTHER the need for uniform implementation of the ISM Code,

HAVING CONSIDERED the recommendations made by the Maritime Safety Committee, at its ninety-first session, and the Marine Environment Protection Committee, at its sixty-fourth session,

1. ADOPTS the *Revised guidelines on implementation of the International Safety Management (ISM) Code by Administrations*, set out in the annex to the present resolution;

2. URGES Governments, when implementing the ISM Code, to adhere to the Revised guidelines;

3. REQUESTS Governments to inform the Organization of any difficulties they may experience when using the Revised guidelines;

4. AUTHORIZES the Maritime Safety Committee and the Marine Environment Protection Committee to keep the annexed Revised Guidelines under review and to amend them as necessary;

5. REVOKES resolution A.1022(26) with effect from [1July 2014].

## REVISED GUIDELINES ON IMPLEMENTATION OF THE ISM CODE BY ADMINISTRATIONS

### Table of contents

# 1 INTRODUCTION

## 1.1 The ISM Code

1.1.1 The *International Management Code for the Safe Operation of Ships and for Pollution Prevention (International Safety Management (ISM) Code)* was adopted by the Organization by resolution A.741(18) and became mandatory by virtue of the entry into force on 1 July 1998 of the SOLAS chapter IX on Management for the Safe Operation of Ships. The ISM Code provides an international standard for the safe management and operation of ships and for pollution prevention.

1.1.2 The Maritime Safety Committee, at its [ninety-second session [.. June 2013], adopted amendments to sections 3, 6, 12, 14, and footnotes of the ISM Code by resolution MSC.[…(92)]. As a result it was necessary to revise the Guidelines on implementation of the ISM Code by Administrations (resolution A.1022(26)), which is superseded by these Revised guidelines.

1.1.3 The ISM Code requires that Companies establish safety objectives as described in section 1.2 (Objectives) of the ISM Code, and in addition that the Companies develop, implement and maintain a safety management system which includes functional requirements as listed in section 1.4 (Functional requirements for a safety management system) of the ISM Code.

1.1.4 The application of the ISM Code should support and encourage the development of a safety culture in shipping. Success factors for the development of a culture that promotes safety and environmental protection are, inter alia, commitment, values, beliefs and clarity of the Safety Management System.

## 1.2 Mandatory application of the ISM Code

1.2.1 The appropriate organization of management, ashore and on board, is needed to ensure adequate standards of safety and pollution prevention. A systematic approach to management by those responsible for management of ships is therefore required. The objectives of the mandatory application of the ISM Code are to ensure:

.1 compliance with mandatory rules and regulations related to the safe operation of ships and protection of the environment; and

.2 the effective implementation and enforcement thereof by Administrations.

1.2.2. Effective enforcement by Administrations must include verification that the safety management system complies with the requirements as stipulated in the ISM Code, as well as verification of compliance with mandatory rules and regulations.

1.2.3 The mandatory application of the ISM Code should ensure, support and encourage the taking into account of applicable codes, guidelines and standards recommended by the Organization, Administrations, classification societies and maritime industry organizations.

## 1.3 Verification and certification responsibilities

1.3.1 The Administration is responsible for verifying compliance with the requirements of the ISM Code and for issuing Documents of Compliance to Companies and Safety Management Certificates to ships.

1.3.2 The Guidelines for the authorization of organizations acting on behalf of the Administration (resolution A.739(18)) and the Specifications on the survey and certification functions of recognized organizations acting on behalf of the Administration (resolution A.789(19)), which have been made mandatory by virtue of SOLAS regulation XI/1, and the Guidelines to assist flag States in the implementation of IMO instruments (resolution A.847(20)), are applicable when Administrations authorize organizations to issue Documents of Compliance and Safety Management Certificates on their behalf.

## 2 SCOPE AND APPLICATION

### 2.1 Definitions

The terms used in these Revised guidelines have the same meaning as those given in the ISM Code.

### 2.2 Scope and application

These Revised guidelines establish basic principles for:

.1 verifying that the safety management system of a Company responsible for the operation of ships, or the safety management system for the ship or ships controlled by the Company, complies with the ISM Code;

.2 carrying out the interim, initial, annual and renewal verification of the Document of Compliance and for the interim, initial, intermediate and renewal verification(s) of the Safety Management Certificate and the issuance/endorsement of corresponding documents; and

.3 the scope of the additional verification.

## 3 VERIFYING COMPLIANCE WITH THE ISM CODE

### 3.1 General

3.1.1 To comply with the requirements of the ISM Code, Companies should develop, implement and maintain a documented safety management system to ensure that the safety and environmental protection policy of the Company is implemented. The Company policy should include the objectives defined by the ISM Code.

3.1.2 Administrations should verify compliance with the requirements of the ISM Code by determining:

.1 the conformity of the Company's safety management system with the requirements of the ISM Code; and

.2 that the safety management system ensures that the objectives defined in paragraph 1.2.3 of the ISM Code are met.

3.1.3 Determining the conformity or non-conformity of safety management system elements with the requirements specified by the ISM Code may demand that criteria for assessment be developed. Administrations are recommended to limit the development of criteria in the form of prescriptive management system solutions. Criteria for assessment in the form of prescriptive requirements may have the effect that safety management in shipping results in Companies implementing solutions prepared by others, and it may then be difficult for a Company to develop the solutions which best suit that particular Company, operation or ship. Therefore, particular operations should be ship specific and fully reflected in manuals, procedures and instructions.

3.1.4 Therefore, Administrations are recommended to ensure that these assessments are based on determining the effectiveness of the safety management system in meeting specified objectives, rather than conformity with detailed requirements in addition to those contained in the ISM Code, so as to reduce the need for developing criteria to facilitate assessment of the Companies' compliance with the Code.

**3.2 Ability of the safety management system to meet general safety management objectives**

The ISM Code identifies general safety management objectives in section 1.2.2. The verification should support and encourage Companies in achieving these objectives, which provide clear guidance to Companies for the development of safety management system elements in compliance with the ISM Code. Since, however, the ability of the safety management system to achieve these objectives cannot be determined beyond whether the safety management system complies with the requirements of the ISM Code, they should not form the basis for establishing detailed interpretations to be used for determining conformity or non-conformity with the requirements of the ISM Code.

**3.3 Ability of the safety management system to meet specific requirements of safety and pollution prevention**

3.3.1 The main criterion which should govern the development of interpretations needed for assessing compliance with the requirements of the ISM Code should be the ability of the safety management system to meet the specific requirements defined by the ISM Code in terms of specific standards of safety and pollution prevention. The specific standards of safety and protection of the environment are specified in section 1.2.3 of the ISM Code.

3.3.2 All records having the potential to facilitate verification of compliance with the ISM Code should be open to scrutiny during an examination, these may include records from delegated SMS tasks. For this purpose, the Administration should ensure that the Company provides auditors with statutory and classification records relevant to the actions taken by the Company to ensure that compliance with mandatory rules and regulations is maintained. In this regard the records may be examined to substantiate their authenticity and veracity.

3.3.3 Some mandatory requirements may not be subject to statutory or classification surveys, such as:

.1 maintaining the condition of ship and equipment between surveys; and

.2 certain operational requirements.

3.3.4 Specific arrangements may be required to ensure compliance with the ISM Code and to provide for the objective evidence needed for verification in these cases, such as:

.1 documented procedures and instructions;

.2 documentation of the verification carried out by senior officers of day-to-day operations when relevant to ensure compliance; and

.3 relevant records of the ships being operated by the Company, e.g. flag State, port State controls, class and accident reports.

3.3.5 The verification of compliance with mandatory rules and regulations, which is part of the ISM Code certification, neither duplicates nor substitutes surveys for other maritime certificates. The verification of compliance with the ISM Code does not relieve the Company, the master or any other entity or person involved in the management or operation of the ship of their responsibilities.

3.3.6 Administrations should ensure that the Company has:

.1 taken into account the recommendations, as referred to in paragraph 1.2.3.2 of the ISM Code, when establishing and maintaining the safety management system; and

.2 developed procedures to ensure that these recommendations are implemented ashore and on board.

## 4 CERTIFICATION AND VERIFICATION PROCESS

### 4.1 Certification and verification activities

4.1.1 The certification process relevant to a Document of Compliance for a Company and a Safety Management Certificate to a ship will normally involve the following steps:

.1 interim verification;

.2 initial verification;

.3 annual or intermediate verification;

.4 renewal verification; and

.5 additional verification.

4.1.2 These verifications are carried out at the request of the Company to the Administration, or to the organization recognized by the Administration to perform certification functions under the ISM Code, or at the request of the Administration by another Contracting Government to the Convention. The verifications will include an audit of the safety management system.

### 4.2 Interim verification

4.2.1 Interim certification may be issued under certain conditions as specified by the ISM Code and should facilitate the implementation of a safety management system.

4.2.2 The Company should apply for interim certification to the Administration.

4.2.3 The process of interim Document of Compliance verification of the management system undertaken by the Administration would require an assessment at the Company's offices in accordance with paragraph 14.1 of the ISM Code.

4.2.4 On satisfactory completion of the assessment of the shoreside safety management system, arrangements/planning may commence for the assessment of applicable Company's ships.

4.2.5 The process of interim verification of the ship should be undertaken by the Administration to ensure that the ship is provided with a safety management system, in accordance with paragraph 14.4 of the ISM Code.

4.2.6 On satisfactory completion of the interim verification, an Interim Document of Compliance will be issued to the Company; copies should be made available by the Company to every shoreside premises and each applicable ship in the Company's fleet. As each ship is assessed and issued with an Interim Safety Management Certificate, a copy of it should also be forwarded to the Company's head office.

**4.3 Initial verification**

4.3.1 The Company should apply for ISM Code certification to the Administration.

4.3.2 An assessment of the shoreside management system undertaken by the Administration would necessitate assessment of the offices where such management is carried out and possibly of other locations which may include delegated SMS tasks, depending on the Company's organization and the functions at the various locations.

4.3.3 On satisfactory completion of the assessment of the shoreside safety management system, arrangements/planning may commence for the assessment of the Company's ships.

4.3.4 On satisfactory completion of the assessment, a Document of Compliance will be issued to the Company, copies of which should be made available to each shoreside premises and each ship in the Company's fleet. As each ship is assessed and issued with a Safety Management Certificate, a copy of it should also be forwarded to the Company's head office.

4.3.5 In cases where certificates are issued by a recognized organization, copies of all certificates should also be sent to the Administration.

4.3.6 The safety management audit for the Company and for a ship will involve the same basic steps. The purpose is to verify that a Company or a ship complies with the requirements of the ISM Code. The audits include:

.1 the conformity of the Company's safety management system with the requirements of the ISM Code, including objective evidence demonstrating that the Company's safety management system has been in operation for at least three months and that a safety management system has been in operation on board at least one ship of each type operated by the Company for at least three months; and

.2 that the safety management system ensures that the objectives defined in paragraph 1.2.3 of the ISM Code are met. This includes verification that the Document of Compliance for the Company responsible for the operation of the ship is applicable to that particular type of ship, and assessment of the shipboard safety management system to verify that it complies with the requirements of the ISM Code, and that it is implemented. Objective evidence demonstrating that the Company's safety management system has been functioning effectively for at least three months on board the ship and ashore should be available, including, inter alia, records from the internal audit performed by the Company.

### 4.4 Annual verification of Document of Compliance

4.4.1 Annual safety management audits are to be carried out to maintain the validity of the Document of Compliance, and should include examining and verifying the correctness of the statutory and classification records presented for at least one ship of each type to which the Document of Compliance applies. The purpose of these audits is to verify the effective functioning of the safety management system, and that any modifications made the Safety Management System comply with the requirements of the ISM Code.

4.4.2 Annual verification is to be carried out within three months before and after each anniversary date of the Document of Compliance.

4.4.3 Where the Company has more than one shoreside premises and/or delegates SMS tasks, the annual assessments should endeavour to ensure that all sites are assessed during the period of validity of the Document of Compliance.

4.4.4 During the annual verification, administrations should verify if the Company is operating all ship types on the DOC. Appropriate action should be taken if the Company has stopped operating a particular ship type.

### 4.5 Intermediate verification of Safety Management Certificates

4.5.1 Intermediate safety management audits should be carried out to maintain the validity of the Safety Management Certificate. The purpose of these audits is to verify the effective functioning of the safety management system and that any modifications made to the safety management system comply with the requirements of the ISM Code. In certain cases, particularly during the initial period of operation under the safety management system, the Administration may find it necessary to increase the frequency of the intermediate verification. Additionally, the nature of non-conformities may also provide a basis for increasing the frequency of intermediate verifications.

4.5.2 If only one intermediate verification is to be carried out, it should take place between the second and third anniversary date of the issue of the Safety Management Certificate.

### 4.6 Renewal verification

Renewal verifications are to be performed before the validity of the Document of Compliance or the Safety Management Certificate expires. The renewal verification will address all the elements of the safety management system and the activities to which the requirements of the ISM Code apply. Renewal verification may be carried out from three months before the date of expiry of the Document of Compliance or the Safety Management Certificate, and should be completed before their date of expiry.

### 4.7 Additional verification

4.7.1 The Administration may, where there are clear grounds, require an additional verification to check if the safety management system still functions effectively. Additional verifications may be carried out following situations beyond normal procedures. Examples of such situations include port state control detentions, reactivation after the interruption of the operations due to a period out of service or to verify that effective corrective actions have been taken and/or properly implemented additional verifications may affect the shore-based organization and/or the shipboard management system. The Administration should determine the scope and depth of the verification, which may vary from case to case. The additional verifications should be completed within the time period agreed taking into account guidelines developed by the Organization. The Administration should follow-up on the results of the verification and take appropriate measures, as necessary.

4.7.2 On satisfactory completion of the shipboard assessment, the Safety Management Certificate should be endorsed for additional verification.

**4.8 Safety management audits**

The procedure for safety management audits outlined in the following paragraphs includes all steps relevant for initial verification. Safety management audits for the interim, annual, intermediate, additional and renewal verification should be based on the same principles even if their scope may be different.

**4.9 Application for audit**

4.9.1 The Company should submit a request for audit to the Administration or to the organization recognized by the Administration for issuing a Document of Compliance or a Safety Management Certificate on behalf of the Administration.

4.9.2 The Administration or the recognized organization should then nominate the lead auditor and, if relevant, the audit team.

**4.10 Preliminary review (Document review)**

As a basis for planning the audit, the auditor should review the safety management manual to determine the adequacy of the safety management system in meeting the requirements of the ISM Code. If this review reveals that the system is not adequate, the audit will have to be delayed until the Company undertakes corrective action.

**4.11 Preparing the audit**

4.11.1 The auditor should review the relevant safety performance records of the Company, and take them into consideration when preparing the audit plan, for example flag State, port State controls, class and accident reports.

4.11.2 The nominated lead auditor should liaise with the Company and produce an audit plan.

4.11.3 The auditor should provide the working documents which are to govern the execution of the audit to facilitate the assessments, investigations and examinations in accordance with the standard procedures, instructions and forms which have been established to ensure consistent auditing practices.

4.11.4 The audit team should be able to communicate effectively with auditees.

**4.12 Executing the audit**

4.12.1 The audit should start with an opening meeting in order to introduce the audit team to the Company's senior management, summarize the methods for conducting the audit, confirm that all agreed facilities are available, confirm time and date for a closing meeting and clarify possible unclear details relevant to the audit.

4.12.2 The audit team should assess the safety management system on the basis of the documentation presented by the Company, and objective evidence as to its effective implementation.

4.12.3 The objective evidence should be collected through interviews and examination of documents. Observation of activities and conditions may also be included when necessary to determine the effectiveness of the safety management system in meeting the specific standards of safety and protection of the environment required by the ISM Code.

4.12.4 Audit findings should be documented. After activities have been audited, the audit team should review the objective evidence collected. This should then be used to determine what is to be reported as major non-conformities, non-conformities or observations, and should be reported in terms of the general and specific provisions of the ISM Code.

4.12.5 At the end of the audit, prior to preparing the audit report, the audit team should hold a meeting with the senior management of the Company and those responsible for the functions concerned. The purpose is to present the observations in such a way as to ensure that the results of the audit are clearly understood.

### 4.13 Audit report

4.13.1 The audit report should be prepared under the direction of the lead auditor, who is responsible for its accuracy and completeness.

4.13.2 The audit report should include the audit plan, identification of audit team members, dates and identification of the Company, observations on any non-conformities and observations on the effectiveness of the safety management system in meeting the specified objectives.

4.13.3 The Company should receive a copy of the audit report. The Company should be advised to provide a copy of the shipboard audit reports to the ship.

### 4.14 Corrective action follow-up

4.14.1 The Company is responsible for determining and initiating the corrective action needed to correct a non-conformity or to correct the cause of the non-conformity. Failure to correct non-conformities with specific requirements of the ISM Code may affect the validity of the Document of Compliance and related Safety Management Certificates.

4.14.2 Corrective actions and possible subsequent audits should be completed within the time period agreed. For corrective actions this should not normally exceed three months. The Company should apply for the follow-up audits as agreed.

4.14.3 Failure to take adequate corrective actions, in compliance with the requirements of the ISM Code, including measures to prevent recurrence, may be considered as a major non-conformity.

### 4.15 Company responsibilities pertaining to safety management audits

4.15.1 The verification of compliance with the requirements of the ISM Code does not relieve the Company, management, those undertaking delegated SMS tasks, officers or seafarers of their obligations as to compliance with national and international legislation related to safety and protection of the environment.

4.15.2 The Company is responsible for:

.1 informing relevant employees and those undertaking delegated SMS tasks about the objectives and scope of the ISM Code certification;

.2 appointing responsible members of staff to accompany members of the team performing the certification;

.3 providing the resources needed by those performing the certification to ensure an effective and efficient verification process;

.4 providing access and evidential material as requested by those performing the certification; and

.5 cooperating with the verification team to permit the certification objectives to be achieved.

4.15.3 Where major non-conformities are identified, Administrations and recognized organizations (ROs) should comply with the procedures stated in the *Procedures concerning observed ISM Code major non-conformities* (MSC/Circ.1059-MEPC/Circ.401).

**4.16 Responsibilities of the organization performing the ISM Code certification**

The organization performing the ISM Code certification is responsible for ensuring that the verification and certification process is performed according to the ISM Code and these Guidelines. This includes management control of all aspects of the certification according to the appendix to these Guidelines.

**4.17 Responsibilities of the verification team**

4.17.1 Whether the verifications involved with certification are performed by a team or not, one person should be in charge of the verification. The leader should be given the authority to make final decisions regarding the conduct of the verification and any observations. His responsibilities should include:

.1 preparation of a plan for the verification; and

.2 submission of the report of the verification.

4.17.2 Personnel participating in the verification are responsible for complying with the requirements governing the verification, ensuring confidentiality of documents pertaining to the certification and treating privileged information with discretion.

**Appendix**

**STANDARDS ON ISM CODE CERTIFICATION ARRANGEMENTS**

## 1 INTRODUCTION

The audit team involved with ISM Code certification, and the organization under which it may be managed, should comply with the specific requirements stated in this appendix.

## 2 STANDARD OF MANAGEMENT

2.1 Organizations managing verification of compliance with the ISM Code should have, in their own organization, competence in relation to:

- .1 ensuring compliance with the rules and regulations, including certification of seafarers, for the ships operated by the Company;
- .2 approval, survey and certification activities;
- .3 the terms of reference that must be taken into account under the safety management system as required by the ISM Code; and
- .4 practical experience of ship operation.

2.2 The Convention requires that organizations recognized by Administrations for issuing a Document of Compliance and a Safety Management Certificate at their request should comply with resolutions A.739(18) − *Guidelines for the authorization of organizations acting on behalf of the Administration* and A.789(19) − *Specifications on the survey and certification functions of recognized organizations acting on behalf of the Administration*.

2.3 Any organization performing verification of compliance with the provisions of the ISM Code should ensure that there exists independence between the personnel providing consultancy services and those involved in the certification procedure.

## 3 STANDARDS OF COMPETENCE

### 3.1 ISM Code certification scheme management

Management of ISM Code certification schemes should be carried out by those who have practical knowledge of ISM Code certification procedures and practices.

### 3.2 Basic competence for performing verification

3.2.1 Personnel who are to participate in the verification of compliance with the requirements of the ISM Code should have a minimum of formal education comprising the following:

- .1 qualifications from a tertiary institution recognized by the Administration or by the recognized organization within a relevant field of engineering or physical science (minimum two years programme); or
- .2 qualifications from a marine or nautical institution and relevant seagoing experience as a certified ship officer.

3.2.2 They should have undergone training to ensure adequate competence and skills for performing verification of compliance with the requirements of the ISM Code, particularly with regard to:

.1 knowledge and understanding of the ISM Code;

.2 mandatory rules and regulations;

.3 the terms of reference which the ISM Code requires that Companies should take into account;

.4 assessment techniques of examining, questioning, evaluating and reporting;

.5 technical or operational aspects of safety management;

.6 basic knowledge of shipping and shipboard operations; and

.7 participation in at least one marine-related management system audit.

3.2.3 Such competence should be demonstrated through written or oral examinations, or other acceptable means.

**3.3 Competence for initial verification and renewal verification**

3.3.1 In order to assess fully whether the Company or the ship complies with the requirements of the ISM Code, in addition to the basic competence stated under 3.2 above, personnel who are to perform initial verifications or renewal verifications for a Document of Compliance or a Safety Management Certificate must possess the competence to:

.1 determine whether the safety management system elements conform or do not conform with the requirements of the ISM Code;

.2 determine the effectiveness of the Company's safety management system, or that of the ship, to ensure compliance with rules and regulations as evidenced by the statutory and classification survey records;

.3 assess the effectiveness of the safety management system in ensuring compliance with other rules and regulations which are not covered by statutory and classification surveys and enabling verification of compliance with these rules and regulations; and

.4 assess whether the safe practices recommended by the Organization, Administrations, classification societies and maritime industry organizations have been taken into account.

3.3.2 This competence can be accomplished by teams which together possess the total competence required.

3.3.3 Personnel who are to be in charge of initial verification or renewal verification of compliance with the requirements of the ISM Code should have at least five years' experience in areas relevant to the technical or operational aspects of safety management, and should have participated in at least three initial verifications or renewal verifications. Participation in verification of compliance with other management standards may be considered as equivalent to participation in verification of compliance with the ISM Code.

### 3.4 Competence for annual, intermediate and interim verification

Personnel who are to perform annual, intermediate and interim verifications should satisfy basic requirements for personnel participating in verifications and should have participated in a minimum of two annual, renewal or initial verifications. They should have received special instructions needed to ensure that they possess the competence required to determine the effectiveness of the Company's safety management system.

## 4 QUALIFICATION ARRANGEMENTS

Organizations performing ISM Code certification should have implemented a documented system for qualification and continuous updating of the knowledge and competence of personnel who are to perform verification of compliance with the ISM Code. This system should comprise theoretical training courses covering all the competence requirements and the appropriate procedures connected to the certification process, as well as practical tutored training, and it should provide documented evidence of satisfactory completion of the training.

## 5 CERTIFICATION PROCEDURES AND INSTRUCTIONS

Organizations performing ISM Code certification should have implemented a documented system to ensure that the certification process is performed in accordance with this standard. This system should, inter alia, include procedures and instructions for the following:

.1 contract agreements with Companies;

.2 planning, scheduling and performing verification;

.3 reporting results from verification;

.4 issuance of Documents of Compliance, Safety Management Certificates and Interim Documents of Compliance and Safety Management Certificates; and

.5 corrective action and follow-up of verifications, including actions to be taken in cases of major non-conformity.

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# ANNEX 24

## DRAFT ASSEMBLY RESOLUTION

## REVISED GUIDELINES FOR A STRUCTURE OF AN INTEGRATED SYSTEM OF CONTINGENCY PLANNING FOR SHIPBOARD EMERGENCIES

THE ASSEMBLY

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety and the prevention and control of marine pollution from ships,

RECALLING ALSO that the 1994 International Conference of Contracting Governments to the International Convention for the Safety of Life at Sea (SOLAS), 1974, adopted amendments to that Convention introducing, inter alia, a new chapter IX on Management for the Safe Operation of Ships, which makes compliance with the International Management Code for the Safe Operation of Ships and for Pollution Prevention (International Safety Management (ISM) Code) mandatory,

BEING AWARE that shipboard emergency plans addressing different categories of emergencies are required under the provisions of the 1974 SOLAS Convention, as amended, and the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, as amended,

RECALLING resolution A.852(20), by which it adopted the *Guidelines for a structure of an integrated system of contingency planning for shipboard emergencies*, containing guidance to assist in the preparation and use of a module structure of an integrated system of shipboard emergency plans,

BEING CONCERNED that the presence on board ships of different and non-harmonized emergency plans may be counterproductive in case of an emergency,

RECOGNIZING that many ships already make use of comprehensive and effective emergency plans, such as the Shipboard Oil Pollution Emergency Plan (SOPEP),

CONSCIOUS of the need that human element aspects are borne in mind when rules and recommendations affecting shipboard operations are considered for adoption,

WISHING to assist shipowners, ship operators and other parties concerned in, where this has not yet been done, transposing the provisions regulating emergency plans into a coherent contingency regime,

HAVING CONSIDERED the recommendations made by the Maritime Safety Committee at its ninety-first session and by the Marine Environment Protection Committee at its sixty-fourth session,

1. ADOPTS the Revised guidelines for a structure of an integrated system of contingency planning for shipboard emergencies, set out in the annex to the present resolution;

2. INVITES Governments, in the interests of uniformity, to accept the aforementioned structure as being in conformity with the provisions for the development of the shipboard emergency plans required by various instruments adopted by the Organization;

3. INVITES Governments to refer to these Revised guidelines when preparing appropriate national legislation;

4. REQUESTS the Maritime Safety Committee and the Marine Environment Protection Committee to keep the Revised guidelines under review and amend them as necessary in the light of experience gained.

5. REVOKES resolution A.852(20) with effect from [1 July 2014].

ANNEX

# REVISED GUIDELINES FOR A STRUCTURE OF AN INTEGRATED SYSTEM OF CONTINGENCY PLANNING FOR SHIPBOARD EMERGENCIES

## Contents

## PREFACE

These Guidelines, prepared by the Maritime Safety Committee (MSC) and the Marine Environment Protection Committee (MEPC) of the International Maritime Organization (IMO), contain guidance to assist in the preparation of an integrated system of contingency planning for shipboard emergencies. It is intended to be used for the preparation and use of a module structure of an integrated system of shipboard emergency plans.

The high number of non-harmonized shipboard contingency plans justifies the development of an integrated system and the harmonization of the structure of contingency plans.

Shipboard emergency preparedness is required under paragraphs 1.2.2.2 and 8 of the ISM Code, as amended, referred to in chapter IX of the SOLAS Convention, as amended, under chapter III, regulation 24-4 of the SOLAS Convention, as adopted at the SOLAS Conference November 1995, and under MARPOL 73/78, Annex I, regulation 26.

To implement the SOLAS and MARPOL regulations, there must be shipboard procedures and instructions. These Revised guidelines provide a framework for formulating procedures for the effective response to emergency situations identified by the company and shipboard personnel.

In this context, the main objectives of these Revised guidelines are:

.1 to assist companies in translating the requirements of the regulations into action by making use of the structure of the integrated system;

.2 to integrate relevant shipboard emergency situations into such a system;

.3 to assist in the development of harmonized contingency plans which will enhance their acceptance by shipboard personnel and their proper use in an emergency situation; and

.4 to encourage Governments, in the interests of uniformity, to accept the structure of the integrated system as being in conformity with the provisions for development of shipboard contingency plans as required by various IMO instruments, and to refer to these Guidelines when preparing appropriate national legislation.

## 1 GENERAL REMARKS

1.1 The ISM Code establishes an international standard for the safe management and operation of ships by defining elements which must be taken into account for the organization of company management in relation to ship safety and pollution prevention. Since emergencies, as well as cargo spillage, cannot be entirely controlled either through design, or through normal operational procedures, emergency preparedness and pollution prevention should form part of the company's ship safety management. For this purpose, every company is required by the ISM Code to develop, implement and maintain a Safety Management System (SMS).

1.2 Within this SMS, potential emergency shipboard situations should be identified and procedures should be established to respond to them.

1.3 If the preparation of response actions for the many possible varying types of emergency situations which may occur are formulated on the basis of a complete and detailed case-by-case consideration, a great deal of duplication will result.

1.4 To avoid duplication, shipboard contingency plans must differentiate between "initial actions" and the major response effort involving "subsequent response", depending on the emergency situation and the type of ship.

1.5 A two-tier course of action provides the basis for a modular approach, which can avoid unnecessary duplication.

1.6 It is recommended that a uniform and integrated system of shipboard emergency plans should be treated as part of the International Safety Management (ISM) Code, forming a fundamental part of the company's individual Safety Management System (SMS).

1.7 An illustration of how such a structure of a uniform and integrated system of shipboard emergency plans with its different modules can be incorporated into an individual SMS is shown in appendix 1.

## 2 INTEGRATED SYSTEM OF CONTINGENCY PLANS FOR SHIPBOARD EMERGENCIES

### 2.1 Scope

2.1.1 The integrated system of shipboard emergency plans (hereinafter referred to as the "system") should provide a framework for the many individual contingency plans (hereinafter referred to as the "plans"), tailored for a variety of potential emergencies, for a uniform and modular designed structure.

2.1.2 Use of a modular designed structure will provide a quickly visible and logically sequenced source of information and priorities, which can reduce error and oversight during emergency situations.

### 2.2 Structure of the system

2.2.1 The structure of the system comprises the following six modules, the titles of which are:

Module I: Introduction
Module II: Provisions
Module III: Planning, preparedness and training
Module IV: Response actions
Module V: Reporting procedures
Module VI: Annex(es).

An example of the arrangement of these modules is shown in appendix 2.

2.2.2 Each module should contain concise information to provide guidance and to ensure that all appropriate and relevant factors and aspects, through the various actions and decisions during an emergency response, are taken into account.

### 2.3 Concept of the system

2.3.1 The system is intended as a tool for integrating the many different plans into a uniform and modular structured frame. The broad spectrum of the many required plans which may be developed by a company will result in the duplication of some elements (e.g. reporting) of these plans. Such duplication can be avoided by using the modular structure of the system referred to in 2.2.1.

2.3.2 Although the initial action taken in any emergency will depend upon the nature and extent of the incident, there are some immediate actions which should always be taken – the so-called "initial actions" (see appendix 4). Therefore, a distinction within the plans between "initial actions" and "subsequent response", which depends on variables like the ship's cargo, type of the ship, etc., will help to assist shipboard personnel in dealing with unexpected emergencies and will ensure that the necessary actions are taken in a priority order.

2.3.3 "Subsequent response" is the implementation of the procedures applicable to the emergency.

## 3 SYSTEM MODULES

### 3.1 General principles

3.1.1 As a starting point for the preparation of the system, appendix 3 provides guidance and a quick overview concerning the kind of information which may be inserted into the individual system modules.

3.1.2 Above all, the system should be developed in a user-friendly way. This will enhance its acceptance by shipboard personnel.

3.1.3 For the system as well as the associated plans to be effective it must be carefully tailored to the individual company and ship. When doing this, differences in ship type, construction, cargo, equipment, manning and route have to be taken into account.

### 3.2 Details of the individual modules

#### 3.2.1 *Module I: Introduction*

3.2.1.1 The system should contain a module entitled "Introduction".

3.2.1.2 The content of this module should provide guidance and an overview of the subject-matter.

3.2.1.3 The following is an example of an introductory text:

> "**INTRODUCTION**
>
> 1 The system is intended to prepare shipboard personnel for an effective response to an emergency at sea.
>
> 2 The prime objective of the system is to provide guidance to shipboard personnel with respect to the steps to be taken when an emergency has occurred or is likely to occur. Of equal benefit is the experience of those involved in developing the plan.
>
> 3 The purpose of the system is to integrate contingency plans for shipboard emergency situations and to avoid the development of different, non-harmonized and unstructured plans which would hamper their acceptance by shipboard personnel and their proper use in an emergency situation. Therefore, the system

and its integrated plans should be structured and formatted in their layout and content in a consistent manner.

4 The aim of the system is to ensure the most timely and adequate response to emergencies of varied size and nature, and to remove any threat of serious escalation of the situation. Additionally the system provides a structure to prevent critical steps from being overlooked.

5 The system and associated plans should be seen as dynamic, and should be reviewed after implementation and improved through the sharing of experience, ideas and feedback.

6 It should be kept in mind that there could be problems in communication due to differing language or culture of the shipboard personnel. The system, as well as the integrated plans, will be documents used on board by the master, officers and relevant crew members of the ship, and they must be available in the working language of the crew. Any change in these personnel, which results in a change in the crew's working language requires plans to be issued in the new language. The module should provide information to this effect.

7 The system is to be seen as a tool for implementing the requirements of paragraphs 1.2.2.2 and 8 of the International Safety Management (ISM) Code, or similar regulations in other IMO instruments, in a practical manner."

### 3.2.2 *Module II: Provisions*

3.2.2.1 This module should contain information and explanations on how the system could be developed on the basis of suggestions for improvement made by the individual company and shipboard personnel.

3.2.2.2 The primary objective of shipboard emergency prevention, preparedness and response activities should be to develop and implement an efficient and effective system which will minimize the risks to human life, the marine environment and property, with a continuous effort towards improvement.

3.2.2.3 To achieve this objective, there is a need for coordination of, and consistency in, safety procedures between the company and its ships. Therefore, the module should require that company shore-based and shipboard contingency planning and response are consistent and appropriately linked.

3.2.2.4 Safety involves "top-down" and "bottom-up" commitment to active development and application of safety procedures and practices by all persons both ashore and afloat, including management.

3.2.2.5 Free and open communication when evaluating emergency procedures, taking into consideration accidents and near misses when using this system, should be pursued, with the objective of improving accident prevention, preparedness and response aboard ships. The module should take care of this recommendation by providing information for the implementation of an error reduction strategy with appropriate feedback and procedures for modification of plans.

3.2.2.6 In summary, the module should inform the system user about the most important requirements with which, at a minimum, the plans should comply. The following main elements should be addressed in the module:

.1 procedures to be followed when reporting an emergency;

.2 procedures for identifying, describing and responding to potential emergency shipboard situations; and

.3 programmes/activities for the maintenance of the system and associated plans.

**3.2.3** ***Module III: Planning, preparedness and training***

3.2.3.1 This module should provide for emergency training and education of shipboard personnel with a view to developing general awareness and understanding of actions to be taken in the event of an emergency.

3.2.3.2 The system and plans will be of little value if the personnel who are to use them are not made familiar with them. Module III should therefore provide practical information which enables each key member of the shipboard personnel to know in advance what their duties and responsibilities are and to whom they are to report under the plans. Responsibility should be assigned for each emergency system, and it should be incumbent on the Company that all relevant officers and crew members should understand, be trained and should be capable of operating the emergency systems, such as fixed fire extinguishing systems, emergency generator, emergency steering, fire pumps, etc.

3.2.3.3 Successful management of an emergency or marine crisis situation depends on the ability of the shipboard personnel, the company, and external emergency coordinating authorities to muster sufficient resources in the right positions quickly.

3.2.3.4 An important goal of planning, preparedness and training programmes should be to increase awareness of safety and environmental issues.

3.2.3.5 Training should be at regular intervals and, in particular, be provided to shipboard personnel transferred to new assignments.

3.2.3.6 Records of all emergency drills and exercises conducted ashore and on board should be maintained and be available for verification. The drills and exercises should be evaluated as an aid to determining the effectiveness of documented procedures and identifying system improvements.

3.2.3.7 When developing plans for drills and exercises, a distinction should be made between full-scale drills involving all the parties that may be involved in a major incident and exercises limited to the ship and/or the company.

3.2.3.8 Feedback is essential for refining emergency response plans and emergency preparedness based on the lessons learned from previous exercises, accident investigations 13 or real emergencies, and provides an avenue for continuous improvement. Feedback should ensure that the company, as well as the ship, is prepared to respond to shipboard emergencies (see summarizing flow diagram in appendix 1).

3.2.3.9 In conclusion, the module should, as a minimum, provide information on the procedures, programmes or activities developed in order to:

.1 familiarize shipboard personnel with the provisions of the system and plans;

.2 provide training for shipboard personnel about the system and plans, in particular to personnel transferred to new assignments;

.3 schedule regular drills and exercises to prepare shipboard personnel to deal with potential shipboard emergency situations;

.4 coordinate the shipboard personnel and the company's actions effectively, and include and take note of the aid which could be provided by external emergency coordinating authorities; and

.5 prepare a workable feedback system.

### 3.2.4 *Module IV: Response actions*

This module should provide guidance for shipboard personnel in an emergency when the ship is underway, berthed, moored, at anchor, in port or dry-dock.

3.2.4.1 In an emergency, the best course of action to protect the personnel, ship, marine environment and cargo requires careful consideration and prior planning. Standards for shipboard procedures to protect personnel, stabilize conditions, and minimize environmental damage when an incident occurs should therefore be developed.

3.2.4.2 In this context reference is made to the guidelines already developed by the Organization, which contain information to provide a starting point and to assist personnel in the preparation of plans for individual ships.

3.2.4.3 The variety of plans to be incorporated in the system should be simple documents which outline procedures different from those used for daily routine operations. With normal operational procedures very difficult problems can be handled, but an emergency situation, whether on the ship at sea or in a port, can extend those involved beyond their normal capabilities.

3.2.4.4 In order to keep the plans held by ship and shore identical, and to reduce possible confusion in an emergency as to who is responsible for which action, plans should make clear whether the action should be taken by shipboard personnel or shoreside personnel.

3.2.4.5 Taking these particulars into consideration, the module "Response actions" should comprise main groupings of emergency shipboard situations.

3.2.4.6 Potential emergency situations should be identified in the plans, including, but not limited to, the following main groups of emergency:

.1 fire;

.2 damage to the ship;

.3 pollution;

.4 unlawful acts threatening the safety of the ship and the security of its passengers and crew;

.5 personnel accidents;

.6 cargo-related accidents; and

.7 emergency assistance to other ships.

In order to give the company the necessary flexibility for identifying, describing and responding to further shipboard emergency situations, more specific types of emergency should be included in the main groups.

3.2.4.7 The above-mentioned main groups can be further subdivided to cover the majority of shipboard emergencies. The detailed response actions should be formulated so as to set in motion the necessary steps to limit the consequence of the emergency and the escalation of damage following, for example, collision or grounding.

3.2.4.8 The Company should identify all possible situations where shipboard contingency planning would be required relative to the operational requirements, ship's type, equipment and trade. The Company should consider which shipboard contingency plans should be reviewed and/or updated whenever changing trade patterns.

3.2.4.9 In all cases priority should be given to actions which protect life, the marine environment and property, in that order. This means that "initial actions" which are common for all ships, regardless of their type and the cargoes carried, should be fully taken into account when formulating "subsequent response" procedures.

3.2.4.10 The planning of subsequent response actions should include information relating to the individual ship and its cargo, and provide advice and data to assist the shipboard personnel. Examples of such information are listed below:

.1 Information on:

  .1 the number of persons aboard; and

  .2 the cargo carried (e.g. dangerous goods, etc.);

.2 Steps to initiate external response:

  .1 search and rescue coordination;

  .2 buoyancy, strength and stability calculations;

  .3 engagement of salvors/rescue towage;

  .4 lightering capacity; and

  .5 external clean-up resources;

.3 Ship drift characteristics; and

.4 General information:

  .1 cooperation with national and port authorities; and

  .2 public relations.

3.2.4.11 Although shipboard personnel should be familiar with the plan, ease of reference is an important element in compiling and using an effective plan. Allowance must be made for quick and easy access to essential information under stressful conditions. Appendices 3 and 4 show a detailed picture of the sequence of priorities for "initial actions" in an emergency situation and their link with the "subsequent response".

3.2.4.12 In summary, the module should guide those responsible for developing the system on what should be included in emergency plans, namely:

.1 coordination of response efforts;

.2 response procedures for the entire spectrum of possible accident scenarios, including methods that protect life, the marine environment and property;

.3 the person or persons identified by title or name as being in charge of all response activities;

.4 the communication lines used for ready contact with external response experts;

.5 information concerning the availability and location of response equipment; and

.6 reporting and communication procedures on board ship.

A seven-step approach flow chart for emergency plan(s) implementation is presented at the end of section 4.

### 3.2.5 *Module V: Reporting procedures*

3.2.5.1 A ship involved in an emergency situation, or in a marine pollution incident will have to communicate with the appropriate ship interest contacts and coastal State or port contacts. Therefore the system must specify in appropriate detail the procedures for making the initial report to the parties concerned. This module should take care of the following:

3.2.5.2 Every effort should be made to assure that information regarding:

.1 ship interest contacts;

.2 coastal State contacts; and

.3 port contacts,

for reporting emergencies are part of the system and are regularly updated.

3.2.5.3 The establishment and maintenance of rapid and reliable 24-hour communication lines between the ship in danger and emergency control centre(s), company's main office and national authorities (RCC, points of contact), is important.

3.2.5.4 Those managing response operations on board and services assisting ashore should keep each other mutually informed of the situation.

3.2.5.5 Details such as telephone, telex and telefax numbers must be routinely updated to take account of personnel changes. Clear guidance should also be provided regarding the preferred means of communication.

3.2.5.6 In this context, reference is made to the Organization's guidelines and other national specific plans which give sufficient guidance on the following reporting activities necessary:

.1 when to report;

.2 how to report;

.3 whom to contact; and

.4 what to report.

**3.2.6** ***Module VI: Annex(es)***

In addition to the information required to respond successfully to an emergency situation, other requirements that will enhance the ability of shipboard personnel to locate and follow-up operative part 5 of the plan may be required.

## 4 Example format for a procedure of a selected emergency situation

An example format for a procedure of a selected emergency situation referred to in 3.2.4 is shown below.

Emergency Plan(s) Implementation Flow Chart

This flow chart outlines the step-wise approach to carrying out the emergency plan(s) implementation. It indicates steps or objectives to be achieved rather than specific procedures to be followed. Based on experience, a seven-step approach to implementing the plan(s) can be set out which leads to a useful and effective integrated emergency response plan.

STEP 1

Evaluate the risks and hazards which may result in different emergency situations
*(Possible events should be identified and their probability of occurrence and consequences must be addressed to set priorities for planning)*

STEP 2

Identify the required response tasks
*(This step requires a thorough definition of actions which must be taken in an emergency)*

STEP 3

Identify the shipboard emergency response participants and establish their roles, resources and communication lines
*(There is a limited range of potential participants in emergency response aboard; it is important to identify them early)*

STEP 4

Make changes necessary to improve existing plans and integrate them in the system
*(Integrating all existing plans into one plan will reveal problems with overlapping activities and complicated interfaces)*

STEP 5

Prepare final plan(s) and obtain identity with both the shoreside and shipboard plan(s)
*(Once agreement on the integrated plan has been reached, a final plan should be documented out to be kept ready for updating in accordance with the experiences gained under steps 6 and 7)*

STEP 6

Educate the emergency response participants about the integrated system and plan(s) and ensure that all emergency responders are trained
*(It is important that emergency responders are well trained)*

STEP 7

Establish procedures for periodic testing, review and updating of the plan(s)
*(Emergency responders should test the plan on a regular basis. Any deficiencies should then be corrected in the plan and the training programme)*

**1.5**
**MODULE IV**

**Response actions**

| Fire | Damage to the ship | Pollution | Unlawful acts threatening .... .... and crew | Personnel accidents | Cargo-related accidents | Emergency assistance to other ships |
|---|---|---|---|---|---|---|

∇

Emergency Group: **Fire**

Doc. No.: ........................ Page 1 of 4
Issue date: ........................ Revision date: .....................

1. **Purpose and scope**

The following procedure define modes of actions/activities and measures to be taken in case of a **Fire** aboard the vessel. This procedure is a guide but under no circumstances restricts the master's discretion.

2. **Responsibilities**

The master is responsible for the organizational prerequisites for **Fire** emergency handling and for the availability and immediate use of the fire-fighting systems and safety equipment available but should delegate the various tasks to suitable qualified officers.

3. **Measures to be taken**
➔ **"Initial actions"**

3.1 **<u>Measures by the person who observes the fire first</u>**
* Activate nearest fire alarm
* }
* } to be developed by the company
* }

3.2 **<u>Measures by the navigational officer of the watch</u>**
* Activate general alarm
* Call master
* }
* }
* } to be developed by the company
* }
* }

**MODULE IV: Response actions**

Emergency Group: **Fire**

Doc. No.: ..........
Issue date: ..........

Page 2 of 4
Revision date: .........

3.3 **Measures by the master**

* Introduce organized fire-fighting activities
* Keep fire-fighting system(s) - fixed and mobile - ready
* }
* }
* }
* } to be developed by the company
* }
* }
* }
* }
* Make analysis of situation; consider priority of measures
* Start/continue fire-fighting measures (activate fire-fighting system(s) available)

* Monitor progress of fire-fighting measures
* Collect additional information

**MODULE VI**

**Annex(es)**

* Plans, diagrams
* Cargo information
* ....................
*.....................

* Prepare for transmission of distress call/situation report (use prepared standardized format)
* Prepare for record keeping

**MODULE V**

Reporting
Procedures

**Follow-up actions**

* Prepare for bunker/ballast tank operations (if necessary)
* Call for external response (if necessary)

* Check necessity of abandoning vessel
* Disembark passengers (if necessary)

**MODULE IV: Response actions**

Emergency Group: **Fire**

Doc. No.: ........... Page 3 of 4
Issue date: ........... Revision date: .................

3.4 Measures by the master (continuation)

* Assess (structural) damage to vessel and/or cargo
* Check vessel's seaworthiness, buoyancy, stability, trim, list, etc.
* Observe weather forecasts
* Check measures against cargo associated or other hazards caused by fire (spillage of marine pollutants, released gases, cargo securing, oil spillages, etc.)

* Start taking of evidence
* Keep fire watch at fire location
* Restore normal ship routine/operation
* Make used fire-fighting equipment operational
* Transmit final report

**END**

**MODULE VI**

**Annex(es)**

* Plans, diagrams
* Cargo information
* ...........
* ...........

**MODULE V**

Reporting Procedures

Emergency Group Pollution

e.g. **SOPEP**

**MODULE IV: Response actions**

Emergency Group: Fire

Doc. No.: ............. Page 4 of 4
Issue date: ............. Revision date: ..............

**4. Additional measures in case of fire aboard in port**

* Inform harbour/shoreside fire brigade → **MODULE V** Reporting procedures
* hand over fire control plans to harbour/shoreside fire brigade
* inform agency/owner → **MODULE V** Reporting procedures

* Keep international shore connection ready

* Check completeness of crew/passengers/guests, etc.
* inform fire brigade about hazardous/dangerous goods → **MODULE VI** Annex(es)

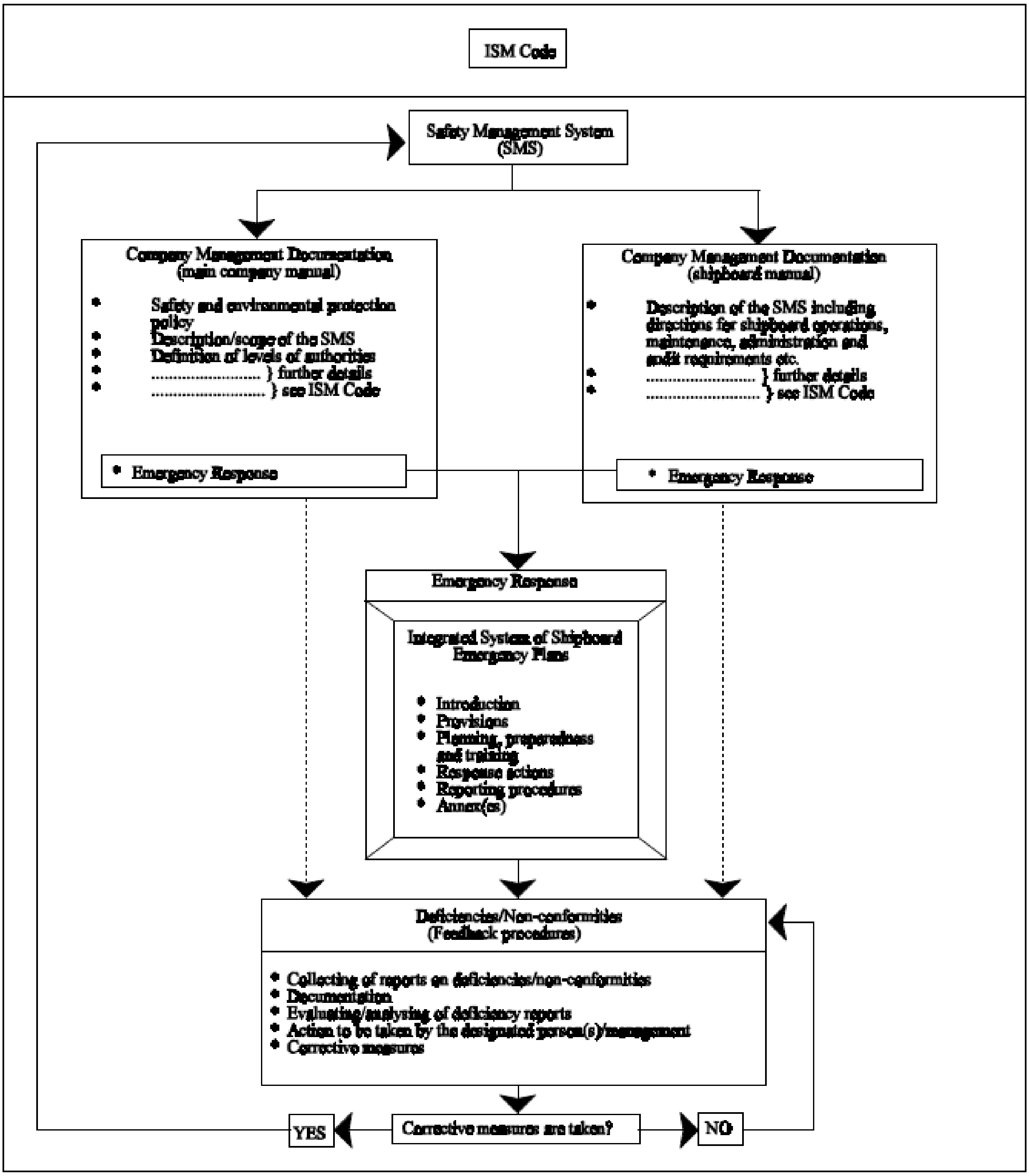
**5. Non-conformity report**

All non-conformities/deficiencies becoming aware by the master, officers and responsible crew members in connection with fire-fighting measures should be collected, recorded and sent to the company/designated person(s) or other nominated person(s) as soon as possible → **MODULE II** Provisions

| |
|---|
| **MODULE V** |
| **Reporting procedures** |
| Emergency Group: **Fire** |
| 1. The master is obliged to report details and to inform all interested parties about the **Fire** emergency and the actions taken so far by means of the fastest telecommunication channels available.<br><br>2. In case of a **Fire** the following reporting procedures are recommended:<br><br>2.1 **Alert** by radiocommunication ships in the vicinity;<br><br>2.2 If the ship stays in or is near port refer to<br><br>* coastal State contact list<br>* port contact list<br><br>for assistance;<br><br>2.3 **Notify** all relevant ship interest contacts who are to be advised in an emergency (reference is made to ship interest contact list) |

## Appendix 1

## INCORPORATION OF AN INTEGRATED SYSTEM OF SHIPBOARD EMERGENCY PLANS IN THE COMPANY'S INDIVIDUAL SAFETY MANAGEMENT SYSTEM (SMS) AS REQUIRED BY THE ISM CODE



## Appendix 2

## THE MODULE STRUCTURE OF AN INTEGRATED SYSTEM FOR SHIPBOARD EMERGENCY PLANS

**Module I - Instruction**

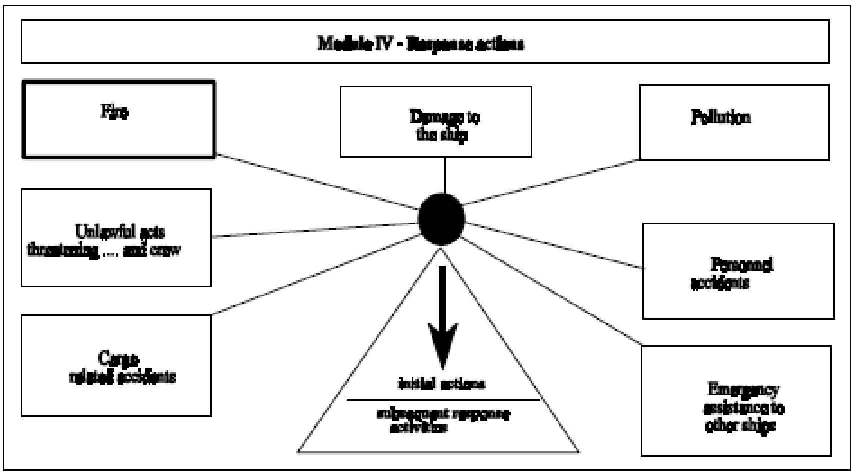
* Introduction text

**Module II - Provision**

* Basic Information
* Maintenance of the system and associated plans
* Consistency between the system and associated plans/feedback system

**Module III - Planning, Preparedness and Training**

* Provisions and information for emergency training and education
* Familiarization with the shipboard and shoreside system associated plans
* Responsibilities/communication lines established with all parties involved
* Information of external co-ordinating authorities/provision for regular drills



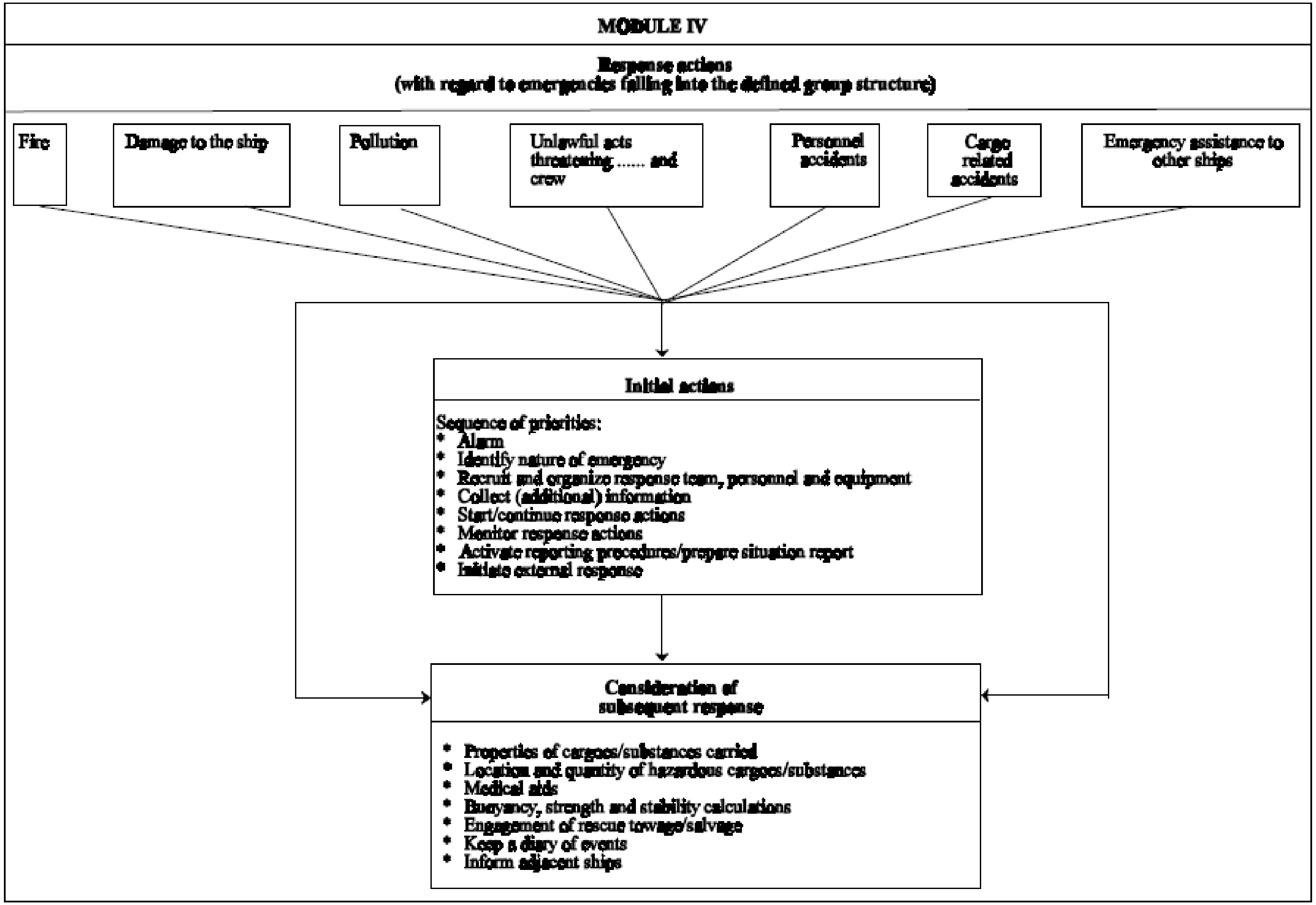

**Module V - Reporting procedure**

* When to report
* How to report
* Whom to contact
* What to report

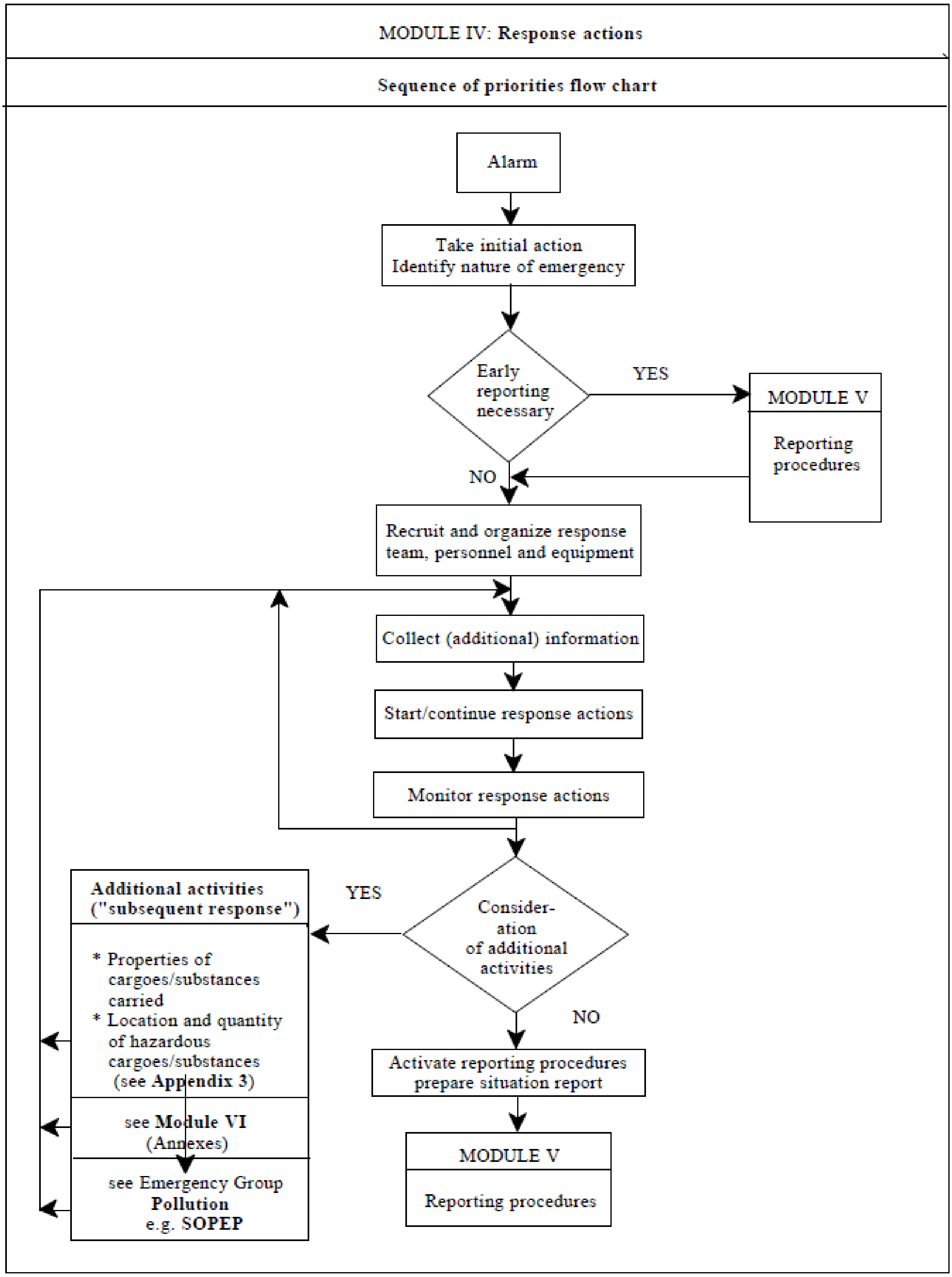
**Module VI - Annex(es)**

* Plans and diagrams concerning details of the ship's general arrangement
* Bunker and ballast information
* Additional documents (e.g. list of contact points)
* Industry guidelines
* Cargo information, etc.

## Appendix 3


MODULE IV
Response actions
(with regard to emergencies falling into the defined group structure)
Fire
Damage to the ship
Pollution
Unlawful acts threatening ...... and crew
Personnel accidents
Cargo related accidents
Emergency assistance to other ships
Initial actions
Sequence of priorities:
* Alarm
* Identify nature of emergency
* Recruit and organize response team, personnel and equipment
* Collect (additional) information
* Start/continue response actions
* Monitor response actions
* Activate reporting procedures/prepare situation report
* Initiate external response
Consideration of subsequent response
* Properties of cargoes/substances carried
* Location and quantity of hazardous cargoes/substances
* Medical aids
* Buoyancy, strength and stability calculations
* Engagement of rescue towage/salvage
* Keep a diary of events
* Inform adjacent ships

## Appendix 4


MODULE IV: Response actions
Sequence of priorities flow chart
Alarm
Take initial action
Identify nature of emergency
Early reporting necessary
YES
MODULE V
Reporting procedures
NO
Recruit and organize response team, personnel and equipment
Collect (additional) information
Start/continue response actions
Monitor response actions
Consider-ation of additional activities
YES
Additional activities ("subsequent response")
* Properties of cargoes/substances carried
* Location and quantity of hazardous cargoes/substances (see Appendix 3)
see Module VI (Annexes)
see Emergency Group Pollution e.g. SOPEP
NO
Activate reporting procedures prepare situation report
MODULE V
Reporting procedures

***

# ANNEX 25

## NEW AND AMENDED TRAFFIC SEPARATION SCHEMES

### "IN THE APPROACHES TO IJMUIDEN"

Reference chart Netherlands 1631 (INT 1418 edition 3)
***Note*:** This chart is based on World Geodetic System 1984 datum (WGS 84)

**IJmuiden West Inner traffic separation scheme**

A separation zone to the north of the IJmuiden-geul is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (1) | 52º 29′.47 N | 4º 20′.03 E | (4) | 52º 30′.90 N | 4º 08′.55 E |
| (2) | 52º 29′.76 N | 4º 20′.12 E | (5) | 52º 30′.36 N | 4º 08′.93 E |
| (3) | 52º 30′.90 N | 4º 10′.17 E | (6) | 52º 30′.38 N | 4º 11′.84 E |

A triangular separation zone north of the IJmuiden-geul is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (7) | 52º 31′.50 N | 4º 10′.60 E | (9) | 52º 32′.73 N | 4º 07′.26 E |
| (8) | 52º 31′.50 N | 4º 08′.13 E | | | |

A traffic lane for westbound traffic is established between the separation zones in paragraphs (a) and (b) above and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (16) | 52º 30′.52 N | 4º 20′.35 E | (17) | 52º 31′.35 N | 4º 13′.25 E |

A separation zone to the south of the IJmuiden-geul is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (11) | 52º 28′.70 N | 4º 19′.80 E | (14) | 52º 30′.04 N | 4º 09′.16 E |
| (12) | 52º 29′.23 N | 4º 19′.96 E | (15) | 52º 29′.87 N | 4º 09′.28 E |
| (13) | 52º 30′.06 N | 4º 12′.50 E | | | |

A traffic lane for eastbound traffic is established between the separation zone in paragraph (d) above and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (20) | 52º 27′.62 N | 4º 19′.48 E | (21) | 52º 28′.58 N | 4º 10′.85 E |

**IJmuiden North traffic separation scheme**

A separation line extending north north-west from the small triangular separation zone in the IJmuiden Inner traffic separation scheme is established between the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (9) | 52º 32′.73 N | 4º 07′.26 E | (10) | 52º 35′.72 N | 4º 05′.15 E |

A traffic lane for north north-west-bound traffic is established between the separation line and the small triangular separation zone in paragraph (a) above and (b) above and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (17) | 52º 31′.35 N | 4º 13′.25 E | (19) | 52º 36′.04 N | 4º 06′.36 E |
| (18) | 52º 33′.28 N | 4º 08′.30 E | | | |

A traffic lane for south south-east-bound traffic is established between the separation line and the triangular separation zone in paragraph (a) above and (b) above and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (31) | 52º 35′.40 N | 4º 03′.95 E | (32) | 52º 31′.50 N | 4º 06′.70 E |

**IJmuiden West outer traffic separation scheme**

A separation zone to the north of the IJmuiden-geul is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (23) | 52º 30′.36 N | 4º 07′.51 E | (25) | 52º 30′.91 N | 3º 56′.18 E |
| (24) | 52º 30′.91 N | 4º 07′.12 E | (26) | 52º 30′.27 N | 3º 55′.98 E |

A separation zone to the south of the IJmuiden-geul is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (27) | 52º 29′.22 N | 4º 08′.31 E | (29) | 52º 29′.95 N | 3º 55′.87 E |
| (28) | 52º 30′.03 N | 4º 07′.74 E | (30) | 52º 27′.60 N | 3º 55′.10 E |

A traffic lane for westbound traffic is established between the separation zone in paragraph (a) above and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (32) | 52º 31′.50 N | 4º 06′.70 E | (33) | 52º 31′.50 N | 3º 56′.38 E |

A traffic lane for eastbound traffic is established between the separation zone in paragraph (b) above and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (22) | 52º 28′.29 N | 4º 08′.97 E | (35) | 52º 25′.53 N | 3º 54′.43 E |
| (34) | 52º 26′.55 N | 3º 57′.50 E | | | |

**AMENDMENTS TO THE EXISTING TRAFFIC SEPARATION SCHEME "OFF TEXEL"**

Reference chart Netherlands 1631 (INT 1418 edition 3)
***Note:*** This chart is based on World Geodetic System 1984 datum (WGS 84)

**Description of the traffic separation scheme**

(a) A separation zone is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (1) | 53° 05'.42 N | 004° 23'.60 E | (5) | No position necessary | |
| (2) | 52° 59'.95 N | 004° 17'.89 E | (6) | 52° 49'.59 N | 003° 58'.56 E |

| | | | | | |
|---|---|---|---|---|---|
| (3) | 52° 51'.85 N | 004° 12'.64 E | (7) | 52° 56'.53 N | 004° 00'.92 E |
| (4) | 52° 45'.85 N | 004° 05'.04 E | (8) | 53° 06'.48 N | 004° 20'.79 E |

(b) A traffic lane for north-eastbound traffic is established between the separation zone in paragraph (a) and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (9) | 53° 03'.82 N | 004° 27'.80 E | (11a) | 52° 44'.60 N | 004° 09'.90 E |
| (10) | 52° 58'.60 N | 004° 22'.34 E | (11b) | 52° 43'.48 N | 004° 09'.14 E |
| (11) | 52° 50'.38 N | 004° 17'.01 E | | | |

(c) A traffic lane for south-westbound traffic is established between the separation zone in paragraph (a) and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (12b) | 52° 56'.67 N | 003° 53'.44 E | (13) | 53° 08'.17 N | 004° 16'.35 E |

(d) A separation zone west of the separation zone in paragraph (a) is established and bounded by the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (14) | 52° 50'.60 N | 003° 56'.80 E | (16) | 52° 54'.31 N | 003° 56'.67 E |
| (15) | 52° 55'.22 N | 003° 58'.32 E | (17) | 52° 52'.31 N | 003° 53'.83 E |

(e) A southbound traffic lane branching off from the main south-westbound traffic lane is established between the separation zones in paragraphs (a) and (d) and the boundaries of the south-westbound traffic lane are extended, as described in paragraphs (f) and (g).

(f) The north-western boundary of the extended south-westbound traffic lane is formed by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (12a) | 52° 35'.71 N | 003° 25'.56 E | (12b) | 52° 56'.67 N | 003° 53'.44 E |

(g) The south-eastern boundary of the extended south-westbound traffic lane is formed by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (17) | 52° 52'.31 N | 003° 53'.83 E | (18) | 52° 36'.04 N | 003° 31'.02 E |

(h) A separation zone at the south-western end of the south-westbound traffic lane is established and bounded by the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (20) | 52° 34'.34 N | 003° 28'.65 E | (22) | 52° 31'.94 N | 003° 28'.01 E |
| (21) | 52° 32'.35 N | 003° 26'.36 E | | | |

(i) A traffic lane for south-westbound traffic is established between the separation zone in paragraph (h) and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (12) | 52° 33'.71 N | 003° 23'.17 E | (12a) | 52° 35'.71 N | 003° 25'.56 E |

(j) A southbound traffic lane branching off from the main south-westbound traffic lane is established between the separation zone in paragraph (h) and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (18) | 52° 36'.04 N | 003° 31'.02 E | (19) | 52° 31'.76 N | 003° 29'.87 E |

***Note:*** The note is to remain unchanged.

**AMENDMENTS TO THE EXISTING TRAFFIC SEPARATION SCHEMES "IN THE APPROACHES TO HOOK OF HOLLAND AND AT NORTH HINDER"**

Reference chart Netherlands 1630 (INT 1416), Edition 4/2010
***Note:*** This chart is based on World Geodetic System 1984 datum (WGS 84)

**Maas North traffic separation scheme**

(a) A separation zone is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (1) | 52° 22′.21 N | 003° 51′.38 E | (3) | 52° 07′.14 N | 003° 47′.10 E |
| (1a) | 52° 19′.17 N | 003° 50′.38 E | (4) | 52° 17′.07 N | 003° 47′.69 E |
| (2) | 52° 07′.17 N | 003° 54′.08 E | (5) | 52° 22′.45 N | 003° 49′.51 E |

(b) A traffic lane for northbound traffic is established between the separation zone in paragraph (a) above and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (6) | 52° 21′.97 N | 003° 53′.28 E | (7) | 52° 07′.18 N | 003° 55′.95 E |
| (6a) | 52° 19′.03 N | 003° 52′.34 E | | | |

(c) A traffic lane for southbound traffic is established between the separation zone in paragraph (a) above and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (8) | 52° 22′.68 N | 003° 47′.73 E | (10) | 52° 07′.13 N | 003° 44′.66 E |
| (9) | 52° 14′.02 N | 003° 44′.96 E | | | |

**Maas North-west traffic separation scheme**

(a) A separation zone is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (13) | 52° 07′.98 N | 003° 31′.54 E | (15) | 52° 05′.96 N | 003° 36′.27 E |
| (14) | 52° 06′.17 N | 003° 36′.64 E | (16) | 52° 07′.72 N | 003° 31′.29 E |

(b) A traffic lane for north-westbound traffic is established between the separation zone in paragraph (a) above and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (11) | 52° 07′.09 N | 003° 38′.25 E | (12) | 52° 09′.08 N | 003° 32′.64 E |

(c) A traffic lane for south-eastbound traffic is established between the separation zone in paragraph (a) above and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (17) | 52° 06′.62 N | 003° 30′.19 E | (18) | 52° 05′.04 N | 003° 34′.66 E |

**Maas West inner traffic separation scheme**

(a) A separation zone to the north of the DW route is outwardly bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (21) | 52° 02′.12 N | 003° 25′.73 E | (23) | 52° 00′.57 N | 003° 35′.17 E |
| (22) | 52° 02′.56 N | 003° 34′.94 E | (24) | 51° 59′.75 N | 003° 25′.29 E |

and inwardly bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (32) | 52° 02′.15 N | 003° 33′.36 E | (34) | 52° 00′.03 N | 003° 27′.01 E |
| (33) | 52° 01′.89 N | 003° 27′.31 E | (35) | 52° 00′.57 N | 003° 33′.51 E |

***Note:*** The inside of the area in the separation zone to the north of the DW route, bounded by a line connecting the following geographical positions (32), (33), (34) and (35), is designated as an anchorage area.

(b) A separation zone to the south of the DW route is outwardly bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (25) | 51° 59′.92 N | 003° 35′.24 E | (26) | 51° 59′.09 N | 003° 25′.17 E |
| (25a) | 51° 59′.89 N | 003° 34′.87 E | (27) | 51° 56′.90 N | 003° 24′.78 E |
| (25b) | 51° 58′.86 N | 003° 33′.51 E | (28) | 51° 58′.25 N | 003° 35′.44 E |
| (25c) | 51° 59′.47 N | 003° 29′.78 E | | | |

Positions 25a and 25b are connected by a circular arc centred on point "25d" (see NAV 58/3/10, annex 3).

(25d) 51° 59.56′ N 003° 33.82′ ERadius of the arc = 0.729 miles

(c) A traffic lane for westbound traffic is established between the separation zone in paragraph (a) above and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (19) | 52° 04′.74 N | 003° 34′.69 E | (20) | 52° 04′.63 N | 003° 26′.20 E |

(d) A traffic lane for eastbound traffic is established between the separation zone in paragraph (b) above and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (29) | 51° 54′.10 N | 003° 24′.29 E | (30) | 51° 56′.26 N | 003° 35′.66 E |

(e) A separation zone between the westbound traffic lane of TSS Maas West Inner and the south-eastbound traffic lane of TSS Maas Northwest is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (17) | 52° 06′.62 N | 003° 30′.19 E | (19) | 52° 04′.74 N | 003° 34′.69 E |
| (18) | 52° 05′.04 N | 003° 34′.66 E | (19a) | 52° 04′.66 N | 003° 28′.25 E |

**Maas West outer traffic separation scheme**

(a) A separation zone to the north of the DW route is outwardly bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (38) | 52° 01′.26 N | 003° 08′.37 E | (40a)* | 51° 58′.79 N | 003° 13′.86 E |
| (39) | 52° 01′.77 N | 003° 18′.81 E | (40b)* | 51° 59′.49 N | 003° 12′.47 E |
| (40) | 51° 59′.15 N | 003° 18′.13 E | (41) | 51° 59′.13 N | 003° 08′.26 E |

* Positions 40a and 40b are connected by a circular arc centred on point "40c" (see NAV 58/3/10, annex 3).

(40c) 51° 58′.77 N 003° 12′.66 ERadius of the arc = 0.729 miles and inwardly bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (42) | 51° 59′.88 N | 003° 13′.89 E | (44) | 52° 01′.05 N | 003° 08′.36 E |
| (43) | 52° 01′.26 N | 003° 12′.56 E | (45) | 51° 59′.40 N | 003° 08′.28 E |

Thus the created inside area in the separation zone is designated as anchor area.

(b) A separation zone to the south of the DW route is outwardly bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (46) | 51° 58′.49 N | 003° 17′.96 E | (48) | 51° 54′.77 N | 003° 07′.49 E |
| (47) | 51° 57′.64 N | 003° 08′.00 E | (49) | 51° 55′.99 N | 003° 17′.31 E |

and inwardly bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (52) | 51° 55′.64 N | 003° 12′.25 E | (54) | 51° 56′.89 N | 003° 07′.87 E |
| (53) | 51° 57′.37 N | 003° 13′.55 E | (55) | 51° 55′.06 N | 003° 07′.54 E |

Thus the created inside area in the separation zone is designated as anchor area.

(c) A traffic lane for westbound traffic is established between the separation zone in paragraph (a) above and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (36) | 52° 04′.54 N | 003° 19′.53 E | (37) | 52° 04′.37 N | 003° 08′.52 E |

(d) A traffic lane for eastbound traffic is established between the separation zone in paragraph (b) above and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (50) | 51° 52′.59 N | 003° 16′.43 E | (51) | 51° 50′.72 N | 003° 06′.78 E |

***Note:*** The inside of the area in the separation zone to the north of the Eurochannel, bounded by a line connecting the following geographical positions (42), (43), (44) and (45), and the inside of the area in the separation zone to the south of the Eurochannel, bounded by a line connecting the following geographical positions (52), (53), (54) and (55), are designated as anchorage areas.

**North Hinder North traffic separation scheme**

(a) A separation zone is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (61) | 52° 07′.29 N | 003° 03′.08 E | (63) | 52° 11′.51 N | 003° 02′.62 E |
| (62) | 52° 09′.38 N | 003° 06′.60 E | (64) | 52° 09′.03 N | 002° 59′.83 E |

(b) A traffic lane for south-westbound traffic is established between the separation zone in (a) above and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (65) | 52° 13′.42 N | 002° 59′.03 E | (66) | 52° 10′.99 N | 002° 56′.16 E |

(c) A traffic lane for north-eastbound traffic is established between the separation zone in (a) above and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (67) | 52° 05′.55 N | 003° 06′.32 E | (68) | 52° 07′.72 N | 003° 09′.70 E |

## AMENDMENTS TO THE EXISTING TRAFFIC SEPARATION SCHEME "OFF RODSHER ISLAND"

Positions are based on World Geodetic System 1984 Datum (WGS 84). The Russian Federation reference chart #23004 (Pulkovo). For obtaining position in WGS datum charted positions should be moved 0'.14 (8".3) westward.

**Amendments to the traffic separation scheme**

(a) A separation zone is bounded by a line connecting the following geographical positions:

| | | |
|---|---|---|
| .1 | 60º 00.43′ N, | 026º 30.16′ E; |
| .2 | 60º 01.05′ N, | 026º 34.86′ E; |
| .3 | 60º 00.35′ N, | 026º 44.24′ E; |
| .4 | 59º 59.85′ N, | 026º 44.08′ E; |
| .5 | 60º 00.15′ N, | 026º 40.21′ E; and |
| .6 | 59º 58.76′ N, | 026º 30.16′ E. |

(b) A traffic lane, one mile wide, is established on each side of the separation zone.

## AMENDMENT TO THE EXISTING TRAFFIC SEPARATION SCHEME "OFF USHANT"

**CHANGE IN THE USE OF THE TWO-WAY ROUTE**

**Amend existing paragraph (h) in the description of the traffic separation scheme "Off Ushant", as follows:**

"The two-way route may be used by:

- passenger ships;
- ships of less than 6,000 gross tonnage, travelling from or towards a port situated between Cape Finisterre and Cap de la Hague.

This authorization does not apply to ships carrying oils listed in appendix I, annex I of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), ships carrying in bulk the substances classified in categories X and Y as defined in regulation 6, annex II of that convention, ships corresponding to the requirements of the International Code for the Construction and Equipment of ships Carrying Liquefied Gases in Bulk (IGC Code) and ships carrying fissile or irradiated materials."

**Consequential amendments to SN/Circ.232:**

Replace existing article 3 with the following text:

"The two-way route may be used by:

- passenger ships;
- ships of less than 6,000 gross tonnage, travelling from or towards a port situated between Cape Finisterre and Cap de la Hague.

This authorization does not apply to ships carrying oils listed in appendix I, annex I of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), ships carrying in bulk the substances classified in categories X and Y as defined in regulation 6, annex II of that convention, ships corresponding to the requirements of the International Code for the Construction and Equipment of ships Carrying Liquefied Gases in Bulk (IGC Code) and ships carrying fissile or irradiated materials."

## AMENDMENTS TO THE EXISTING TRAFFIC SEPARATION SCHEME "IN THE SANTA BARBARA CHANNEL"

(Reference charts: United States 18700, 2003 edition; 18720, 2008 edition.
***Note:*** These charts are based on North American 1983 Datum which is equivalent to WGS 1984 datum.)

**Description of the traffic separation scheme**

The traffic separation scheme in the Santa Barbara Channel consists of two parts:

*Part I*
**Between Point Vicente and Point Conception**

(a) A separation zone is bounded by a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (1) | 34° 20′.84 N, 120° 30′.28 W | (4) | 33° 44′.06 N, 118° 36′.34 W |
| (2) | 34° 03′.87 N, 119° 15′.63 W | (5) | 34° 02′.94 N, 119° 16′.09 W |
| (3) | 33° 44′.93 N, 118° 35′.75 W | (6) | 34° 19′.88 N, 120° 30′.59 W |

(b) A traffic lane for north-westbound traffic is established between the separation zone and a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (7) | 34° 21′.80 N. 120° 29′.96 W | (9) | 33° 45′.80 N, 118° 35′.15 W |
| (8) | 34° 04′.80 N, 119° 15′.16 W | | |

(c) A traffic lane for south-eastbound traffic is established between the separation zone and a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (10) | 33° 43′.18 N, 118° 36′.94 W | (12) | 34° 18′.92 N, 120° 30′.91 W |
| (11) | 34° 02′.01 N, 119° 16′.56W | | |

***Note:***
*Port Hueneme Fairway*
A safety fairway is established in the approach to Port Hueneme.

*Part II*
**Between Point Conception and Point Arguello**

(a) A separation zone is bounded by a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (1) | 34° 20′.84 N, 120° 30′.28 W | (13) | 34° 24′.76 N, 120° 52′.10 W |
| (6) | 34° 19′.88 N, 120° 30′.59 W | (14) | 34° 25′.72 N, 120° 51′.78 W |

(b) A traffic lane for westbound traffic is established between the separation zone and a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (7) | 34° 21′.80 N. 120° 29′.96 W | (15) | 34° 26′.68 N, 120° 51′.46 W |

(c) A traffic lane for eastbound traffic is established between the separation zone and a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (12) | 34° 18′.92 N, 120° 30′.91 W | (16) | 34° 23′.80 N, 120° 52′.42 W |

**AMENDMENTS TO THE EXISTING TRAFFIC SEPARATION SCHEME "OFF SAN FRANCISCO"**

(Reference charts: United States 18680, 2005 edition; 18645, 2008 edition.
***Note:*** These charts are based on North American 1983 Datum which is equivalent to WGS 1984 datum.)

**Description of the traffic separation scheme**

The traffic separation scheme Off San Francisco consists of four parts:

*Part I*
**Northern approach**

(a) A separation zone is bounded by a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (1) | 37° 48′.52 N, 122° 47′.63 W | (38) | 38° 08′.03 N, 123° 21′.34 W. |
| (2) | 37° 58′.45 N, 123° 09′.49 W | (3) | 37° 57′.67 N, 123° 10′.31 W |
| (37) | 38° 09′.09 N, 123° 20′.82 W | (4) | 37° 47′.66 N, 122° 48′.29 W |

(b) A traffic lane for north-westbound traffic is established between the separation zone and a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (5) | 37° 49′.29 N. 122° 46′.79 W | (36) | 38° 10′.14 N, 123° 20′.29 W |
| (6) | 37° 59′.22 N, 123° 08′.66 W | | |

(c) A traffic lane for south-eastbound traffic is established between the separation zone and a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (39) | 38° 06′.92 N, 123° 21′.82 W | (8) | 37° 46′.72 N, 122° 48′.76 W |
| (7) | 37° 56′.89 N, 123° 11′.14 W | | |

*Part II*
**Southern approach**

(a) A separation zone is bounded by a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (9) | 37° 39′.07 N, 122° 40′.40 W | (11) | 37° 18′.71 N, 122° 43′.00 W |
| (10) | 37° 18′.45 N, 122° 40′.40 W | (12) | 37° 39′.12 N, 122° 43′.00 W |

(b) A traffic lane for northbound traffic is established between the separation zone and a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (13) | 37° 39′.30 N. 122° 39′.14 W | (14) | 37° 18′.36 N, 122° 39′.14 W |

(c) A traffic lane for southbound traffic is established between the separation zone and a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (15) | 37° 18′.89 N, 122° 44′.26 W | (16) | 37° 39′.41 N, 122° 44′.26 W |

*Part III*
**Western approach**

(a) A separation zone is bounded by a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (17) | 37° 41′.90 N, 122° 47′.99 W | (19) | 37° 34′.15 N, 123° 00′.37 W |
| (18) | 37° 33′.54 N, 123° 03′.79 W | (20) | 37° 41′.09 N, 122° 47′.25 W |

(b) A traffic lane for south-westbound traffic is established between the separation zone and a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (21) | 37° 42′.81 N. 122° 48′.55 W | (22) | 37° 34′.37 N, 123° 04′.49 W |

(c) A traffic lane for north-eastbound traffic is established between the separation zone and a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (23) | 37° 31′.87 N, 123° 02′.40 W | (24) | 37° 40′.38 N, 122° 46′.33 W |

*Part IV*
**Main ship channel**

(a) A separation line connects the following geographical positions:

| | | | |
|---|---|---|---|
| (25) | 37° 45′.90 N, 122° 38′.00 W | (27) | 37° 48′.10 N, 122° 31′.00 W |
| (26) | 37° 47′.00 N, 122° 34′.30 W | | |

(b) A traffic lane for eastbound traffic is established between the separation zone and a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (28) | 37° 45′.80 N. 122° 37′.70 W | (29) | 37° 47′.80 N, 122° 30′.80 W |

(c) A traffic lane for westbound traffic is established between the separation zone and a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (30) | 37° 46′.20 N, 122° 37′.90 W | (32) | 37° 48′.50 N, 122° 31′.30 W |
| (31) | 37° 46′.90 N, 122° 35′.30 W | | |

**Area to be avoided**

A circular area to be avoided, of radius half a mile, is centred upon geographical position:

(33) 37° 45′.00 N, 122° 41.50 W

**Precautionary area**

A precautionary area is established bounded to the west by an arc of a circle of radius 6 miles centring upon geographic position (33) 37° 45′.00 N, 122° 41′.50 W and connecting with the following geographical positions:

| | | | |
|---|---|---|---|
| (34) | 37° 42′.70 N, 122° 34′.60 W | (35) | 37° 50′.30 N, 122° 38′.00 W |

The precautionary area is bounded to the east by a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (34) | 37° 42′.70 N, 122° 34′.60 W | (35) | 37° 50′.30 N, 122° 38′.00 W |
| (25) | 37° 45′.90 N, 122° 38′.00 W | | |

## AMENDMENTS TO THE EXISTING TRAFFIC SEPARATION SCHEME "IN THE APPROACHES TO LOS ANGELES – LONG BEACH"

(A continuation of the Santa Barbara Channel scheme)
(Reference Chart: United States 18746**,** 2009 edition.
***Note:*** These charts are based on North American 1983 Datum which is equivalent to WGS 1984 datum.)

**Description of the traffic separation scheme**

The traffic separation scheme "In the Approaches to Los Angeles – Long Beach" consists of three parts:

**Western approach**

A separation zone is bounded by a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (1) | 33° 37′.70 N, 118° 17′.60 W | (4) | 33° 44′.06 N, 118° 36′.34 W |
| (2) | 33° 36′.50 N, 118° 17′.60 W | (5) | 33° 44′.93 N, 118° 35′.75 W |
| (3) | 33° 36′.50 N, 118° 20′.48 W | (6) | 33° 37′.70 N, 118° 20′.57 W |

(b) A traffic lane for northbound coastwise traffic is established between the separation zone and a line connecting the following geographical positions:

| | | | |
|---|---|---|---|
| (7) | 33° 38′.70 N, 118° 17′.60 W | (9) | 33° 45′.80 N, 118° 35′.15 W |
| (8) | 33° 38′.70 N, 118° 20′.24 W | | |

(c) A traffic lane for southbound coastwise traffic is established between the separation zone and a line connecting the following geographical positions:

(10) 33° 35′.50 N, 118° 17′.60 W
(11) 33° 35′.50 N, 118° 20′.81 W
(12) 33° 43′.18 N, 118° 36′.94 W

**Southern approach**

(a) A separation zone is established bounded by a line connecting the following geographic positions:

(13) 33° 35′.50 N, 118° 10′.30 W
(14) 33° 35′.50 N, 118° 12′.75 W
(15) 33° 19′.00 N, 118° 05′.60 W
(16) 33° 19′.70 N, 118° 03′.50 W

(b) A traffic lane for northbound traffic is established between the separation zone and a line connecting the following geographical positions:

(17) 33° 35′.50 N, 118° 09′.00 W
(18) 33° 20′.00 N, 118° 02′.30 W

(c) A traffic lane for southbound traffic is established between the separation zone and a line connecting the following geographical positions:

(19) 33° 35′.50 N, 118° 14′.00 W
(20) 33° 18′.70 N, 118° 06′.75 W

**Precautionary area**

(a) The precautionary area consists of the water area enclosed by the Los Angeles – Long Beach breakwater and a line connecting Point Fermin Light at 33° 42′.30N, 118° 17′.60W, with the following geographical positions:

(10) 33° 35′.50 N, 118° 17′.60 W
(17) 33° 35′.50 N, 118° 09′.00 W
(21) 33° 37′.70 N, 118° 06′.50 W
(22) 33° 43′.40 N, 118° 10′.80 W

***Note:***
Pilot boarding areas are located in the precautionary area. Due to heavy vessel traffic, mariners are advised not to anchor or linger in this precautionary area except to pick up or disembark a pilot.

***

# ANNEX 26

## ROUTEING MEASURES OTHER THAN TRAFFIC SEPARATION SCHEMES

## TWO NEW PRECAUTIONARY AREAS AND A NEW AREA TO BE AVOIDED (ATBA) "IN THE APPROACHES TO IJMUIDEN"

Reference chart Netherlands 1631 (INT 1418 edition 3)
***Note:*** This chart is based on World Geodetic System 1984 datum (WGS 84)

### IJmuiden Junction precautionary area

(a) A precautionary area between the IJmuiden Inner and Outer traffic separation schemes is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (21) | 52º 28'.58 N | 004º 10'.85 E | (8) | 52º 31'.50 N | 004º 08'.13 E |
| (22) | 52º 28'.29 N | 004º 08'.97 E | (15) | 52º 29'.87 N | 004º 09'.28 E |
| (32) | 52º 31'.50 N | 004º 06'.70 E | And back to 21 | | |

### Area to be avoided "by IJmuiden northern approaches"

(a) An area to be avoided for all ships is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (i) | 52º 32'.15 N | 004º 04'.82 E | (iii) | 52º 34'.65 N | 004º 02'.22 E |
| (ii) | 52º 34'.04 N | 004º 04'.82 E | (iv) | 52º 32'.79 N | 004º 02'.22 E |
| | | | And back to (i) | | |

(b) The area to be avoided in paragraph (a) above is to be labelled "*Amm. Dumps*"

### IJmuiden Crossing precautionary area

(a) A precautionary area immediately west of the IJmuiden West Outer traffic separation scheme is established by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (33) | 52º 31'.50 N | 003º 56'.38 E | (36) | 52º 25'.16 N | 003º 48'.53 E |
| (35) | 52º 25'.53 N | 003º 54'.43 E | (37) | 52º 31'.50 N | 003º 50'.57 E |
| | | | And back to 33 | | |

***Note:***
**CAUTIONS**

1 (Near the buoyed deep-water channel route in the IJmuiden Junction and IJmuiden Crossing precautionary areas)
For ships that have to cross the deep-water route attention is drawn to rule 18(d)(i) of the 1972 Collision Regulations. Mariners are, however, reminded that when risk of collision is deemed to exist, the 1972 Collision Regulations fully apply and, in particular, the rules of part B, sections II and III are of specific relevance to the crossing situation.

2 (By the entrance of the south-south-eastbound traffic lane of the IJmuiden North traffic separation scheme (see section I of part D))
The area to be avoided on the western boundary of the IJmuiden North traffic separation scheme's south-south-eastbound lane encloses an ammunition dump dating from the end of the Second World War. Mariners are warned not to enter this area and, in particular, not to anchor in it, even in an emergency.

**NEW PRECAUTIONARY AREA, A NEW RECOMMENDED ROUTE AND A NEW AREA TO BE AVOIDED (ATBA) IN THE AREA "WEST OF RIJNVELD"**

Reference chart Netherlands 1630 (INT 1416), edition 4/2010
***Note:*** This chart is based on World Geodetic System 1984 datum (WGS 84)

And:

Reference chart Netherlands 1631 (INT 1418), edition 3
***Note:*** This chart is based on World Geodetic System 1984 datum (WGS 84)

**"Rijnveld" precautionary area**

A precautionary area is established off the entrance to the Rotterdam Waterway. The area is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (1) | 52° 21′.54 N | 003° 27′.14 E | (4) | 52° 07′.81 N | 003° 26′.80 E |
| (2) | 52° 14′.47 N | 003° 29′.38 E | (5) | 52° 12′.85 N | 003° 12′.42 E |
| (3) | 52° 10′.15 N | 003° 29′.58 E | (6) | 52° 20′.22 N | 003° 24′.90 E |

And back to 1

**Recommended southbound route**

A recommended southbound traffic route is established from the southern end of the southbound traffic lane branching from the south-westbound lane of the Off Texel traffic separation scheme to the north end of the Rijnveld precautionary area. The route is marked by dashed outlined arrows which are placed in a direction of 189.2 degrees in between the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (6) | 52° 20′.22 N | 003° 24′.90 E | (8) | 52° 31′.76 N | 003° 29′.87 E |
| (7) | 52° 31′.94 N | 003° 28′.01 E | (1) | 52° 21′.54 N | 003° 27′.14 E |

**Area to be avoided "at De Ruyter"**

An area to be avoided for all ships, except authorized, around the De Ruyter offshore oil and gas installation is established and bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (i) | 52° 21′.12 N | 003° 19′.73 E | (iii) | 52° 22′.75 N | 003° 22′.00 E |
| (ii) | 52° 22′.75 N | 003° 19′.73 E | (iv) | 52° 21′.12 N | 003° 22′.00 E |

And back to i

***Note:***
**CAUTIONS**

1 (Rijnveld West precautionary area)
Mariners are warned that in this precautionary area ships on routes to and from the traffic separation scheme "Off Texel", the River Scheldt and Europoort are merging or crossing.

**AMENDMENT TO THE EXISTING DEEP-WATER ROUTE LEADING TO IJMUIDEN**

Reference chart Netherlands 1631 (INT 1418 edition 3)
***Note:*** This chart is based on World Geodetic System 1984 datum (WGS 84)

**Description of the amended deep-water route**

The deep-water route consists of a deep-water channel (IJ-Geul) and a deep-water approach area (IJ-Geul approach area).

**The deep-water channel (IJ-Geul)**

The specific deep-water channel is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (1) | 52° 28′.10 N | 004° 32′.02 E | (16) | 52° 29′.94 N | 003° 54′.91 E |
| (2)* | 52° 29′.00 N | 004° 24′.16 E | (17) | 52° 29′.95 N | 003° 55′.87 E |
| (3)* | 52° 29′.65 N | 004° 23′.45 E | (18) | 52° 30′.03 N | 004° 07′.74 E |
| (4) | 52° 29′.39 N | 004° 20′.73 E | (19) | 52° 30′.04 N | 004° 09′.16 E |
| (5) | 52° 30′.38 N | 004° 11′.84 E | (20) | 52° 30′.06 N | 004° 12′.50 E |
| (6) | 52° 30′.36 N | 004° 08′.93 E | (21) | 52° 29′.03 N | 004° 21′.70 E |
| (7) | 52° 30′.36 N | 004° 07′.51 E | (22)* | 52° 28′.80 N | 004° 23′.41 E |
| (8) | 52° 30′.27 N | 003° 55′.98 E | (23)* | 52° 28′.80 N | 004° 23′.72 E |
| (9) | 52° 30′.26 N | 003° 54′.91 E | (24) | 52° 27′.81 N | 004° 31′.95 E |

* *Geographical positions (2), (3), (22) and (23) are connected by an arc of a circle with a radius of 0.432 miles centred at geographical position (x)* 52° 29′.22 N 004°23′.56 E

**The deep-water approach area (IJ-Geul approach area)**

The specific deep-water approach area is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (9) | 52° 30′.26 N | 003° 54′.91 E | (13) | 52° 27′.31 N | 003° 40′.51 E |
| (10) | 52° 31′.50 N | 003° 54′.91 E | (14) | 52° 28′.07 N | 003° 49′.47 E |
| (11) | 52° 31′.50 N | 003° 50′.57 E | (15) | 52° 28′.54 N | 003° 54′.91 E |
| (12) | 52° 31′.49 N | 003° 47′.17 E | (16) | 52° 29′.94 N | 003° 54′.91 E |

***Notes:***

Notes 2.1 to 2.4 are to remain unchanged.

Note 2.5, referring to the emergency turning basin, is to be removed.

**AMENDMENTS TO THE EXISTING ROUTEING MEASURES OTHER THAN TRAFFIC SEPARATION SCHEMES "IN THE APPROACHES TO HOOK OF HOLLAND AND AT NORTH HINDER"**

Reference chart Netherlands 1630 (INT 1416), Edition 4/2010
***Note:*** This chart is based on World Geodetic System 1984 datum (WGS 84)

**Maas Centre precautionary area**

A precautionary area is established off the entrance to the Rotterdam Waterway. The area is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (58)[1] | 51° 59′.67 N | 004° 02′.84 E | (18) | 52° 05′.04 N | 003° 34′.66 E |
| (57)[1] | 51° 59′.14 N | 004° 02′.49 E | (15) | 52° 05′.96 N | 003° 36′.27 E |
| (56)[2] | 51° 58′.12 N | 003° 57′.86 E | (14) | 52° 06′.17 N | 003° 36′.64 E |
| (31) | 51° 57′.11 N | 003° 40′.05 E | (11) | 52° 07′.09 N | 003° 38′.25 E |
| (30) | 51° 56′.26 N | 003° 35′.66 E | (10) | 52° 07′.13 N | 003° 44′.66 E |
| (28) | 51° 58′.25 N | 003° 35′.44 E | (3) | 52° 07′.14 N | 003° 47′.10 E |
| (25) | 51° 59′.92 N | 003° 35′.24 E | (2) | 52° 07′.17 N | 003° 54′.08 E |
| (23) | 52° 00′.57 N | 003° 35′.17 E | (7) | 52° 07′.18 N | 003° 55′.95 E |
| (22) | 52° 02′.56 N | 003° 34′.94 E | (59) | 52° 07′.19 N | 004° 00′.08 E |
| (19) | 52° 04′.74 N | 003° 34′.69 E | And back to 58 | | |

[1] Position (58) is the North Mole Head light and position (57) is the South Mole Head Light.
[2] The line between positions (57) and (56) follows southern sea wall.

**Maas Junction precautionary area**

A precautionary area between the Maas West Inner and Outer traffic separation schemes is established by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (20) | 52° 04′.63 N | 003° 26′.20 E | (50) | 51° 52′.59 N | 003° 16′.43 E |
| (21) | 52° 02′.12 N | 003° 25′.73 E | (49) | 51° 55′.99 N | 003° 17′.31 E |
| (24) | 51° 59′.75 N | 003° 25′.29 E | (46) | 51° 58′.49 N | 003° 17′.96 E |
| (26) | 51° 59′.09 N | 003° 25′.17 E | (40) | 51° 59′.15 N | 003° 18′.13 E |
| (27) | 51° 56′.90 N | 003° 24′.78 E | (39) | 52° 01′.77 N | 003° 18′.81 E |
| (29) | 51° 54′.10 N | 003° 24′.29 E | (36) | 52° 04′.54 N | 003° 19′.53 E |

And back to 20

**North Hinder Junction precautionary area**

A precautionary area is established off North Hinder. The area is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (75) | 51° 45′.42 N | 002° 39′.92 E | (67) | 52° 05′.55 N | 003° 06′.32 E |
| (51) | 51° 50′.72 N | 003° 06′.78 E | (61) | 52° 07′.29 N | 003° 03′.08 E |

| | | | | | |
|---|---|---|---|---|---|
| (48) | 51° 54′.77 N | 003° 07′.49 E | (64) | 52° 09′.03 N | 002° 59′.83 E |
| (47) | 51° 57′.64 N | 003° 08′.00 E | (66) | 52° 10′.99 N | 002° 56′.16 E |
| (41) | 51° 59′.13 N | 003° 08′.26 E | (77) | 51° 51′.35 N | 002° 28′.70 E |
| (38) | 52° 01′.26 N | 003° 08′.37 E | (72) | 51° 48′.53 N | 002° 34′.04 E |
| (37) | 52° 04′.37 N | 003° 08′.52 E | (71) | 51° 47′.88 N | 002° 35′.27 E |

And back to 75

**Inshore traffic zone**

An inshore traffic zone south of the Maas West Inner TSS and the Maas Centre is established between the coast and a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (60) | 51° 34′.00 N | 003° 30′.00 E | (31) | 51° 57′.11 N | 003° 40′.05 E |
| (29) | 51° 54′.10 N | 003° 24′.29 E | (56) | 51° 58′.12 N | 003° 57′.86 E |

**Area to be avoided at Maas North**

An area to be avoided for all ships is established within the separation zone of the Maas North traffic separation scheme and is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (i) | 52° 15′.45 N | 003° 51′.42 E | (iii) | 52° 12′.45 N | 003° 48′.32 E |
| (ii) | 52° 12′.45 N | 003° 51′.42 E | (iv) | 52° 15′.45 N | 003° 48′.32 E |

And back to (i)

***Note:***
**CAUTIONS**

1 (Maas Junction precautionary area between Maas West Outer traffic separation scheme and Maas West Inner separation scheme)
Mariners are warned that in this precautionary area ships on routes to and from the traffic separation scheme "Off Texel", the River Scheldt and Europoort are merging or crossing.

2 (Off the seaward entrances to the "Maas West Inner", the "Maas Northwest" and the "Maas North" traffic separation schemes)
The precautionary area in the approaches to Hook of Holland should be avoided by passing traffic which is not entering or leaving the adjacent ports.

3 (Near the deep-water route in the North Hinder Junction precautionary area and near the "deep-water route leading to Europoort" between the "Maas West Outer" and the "Maas West Inner" traffic separation schemes (see section I of part D)).
For ships that have to cross the deep-water route attention is drawn to rule 18(d)(i) of the 1972 Collision Regulations. Mariners are, however, reminded that, when risk of collision is deemed to exist, the 1972 Collision Regulations fully apply and, in particular, the rules of part B, sections II and III are of specific relevance to the crossing situation.

4 (In the Maas North separation zone below the area to be avoided)
The area to be avoided within the Maas North separation zone encloses two ammunition dumps. Mariners are warned not to enter this area and, in particular, not to anchor in it, even in an emergency.

**AMENDMENTS TO THE EXISTING DEEP-WATER ROUTE LEADING TO EUROPOORT**

Reference chart Netherlands 1630 (INT 1416), Edition 4/2010
***Note:*** This chart is based on World Geodetic System 1984 datum (WGS 84)

The deep-water route is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (1) | 51° 59′.52 N | 004° 02′.74 E | (14) | 51° 57′.28 N | 002° 54′.68 E |
| (2) | 51° 59′.94 N | 004° 01′.32 E | (19) | 51° 56′.53 N | 002° 55′.29 E |
| (3)* | 52° 01′.03 N | 003° 56′.91 E | (20) | 51° 57′.64 N | 003° 08′.00 E |
| (4)* | 52° 02′.33 N | 003° 55′.89 E | (21) | 51° 58′.49 N | 003° 17′.96 E |
| (5) | 52° 02′.00 N | 003° 53′.00 E | (22) | 51° 59′.09 N | 003° 25′.17 E |
| (6) | 52° 00′.57 N | 003° 35′.17 E | (23) | 51° 59′.47 N | 003° 29′.78 E |
| (7) | 51° 59′.75 N | 003° 25′.29 E | (24)* | 51° 58′.86 N | 003° 33′.51 E |
| (8) | 51° 59′.15 N | 003° 18′.13 E | (25)* | 51° 59′.89 N | 003° 34′.87 E |
| (9)* | 51° 58′.79 N | 003° 13′.86 E | (26)* | 52° 01′.35 N | 003° 52′.98 E |
| (10)* | 51° 59′.47 N | 003° 12′.28 E | (27)* | 52° 01′.16 N | 003° 55′.07 E |
| (11) | 51° 59′.13 N | 003° 08′.26 E | (28) | 51° 59′.66 N | 004° 01′.12 E |
| (12)* | 52° 00′.37 N | 003° 01′.29 E | (29) | 51° 59′.26 N | 004° 02′.57 E |
| (13)* | 51° 58′.24 N | 002° 57′.73 E | | | |

* *These positions are connected by circular arcs centred about the following points:*

| Ref. | Latitude | Longitude | Radius in nm | Arc between points |
|---|---|---|---|---|
| (a) | 52° 01′.65 N | 3° 56′.28 E | 0′.729 | (3) & (4) |
| (b) | 51° 58′.77 N | 3° 12′.66 E | 0′.729 | (9) & (10) |
| (c) | 51° 58′.73 N | 3° 00′.42 E | 1′.728 | (12) & (13) |
| (d) | 51° 59′.56 N | 3° 33′.82 E | 0′.729 | (24) & (25) |
| (e) | 51° 58′.59 N | 3° 53′.40 E | 2′.775 | (26) & (27) |

The mandatory one way deep-water approach route to Eurogeul for inbound vessels with the draught over 17.4 m from the south is bounded by a line connecting the following geographical positions:

| | | | | | |
|---|---|---|---|---|---|
| (14) | 51° 57′.28 N | 002° 54′.68 E | (17) | 51° 50′.04 N | 002° 41′.75 E |
| (15) | 51° 54′.41 N | 002° 45′.65 E | (18) | 51° 53′.17 N | 002° 46′.62 E |
| (16) | 51° 50′.94 N | 002° 40′.25 E | (19) | 51° 56′.53 N | 002° 55′.29 E |

***Notes:***

1 *Least water depths*

The limiting depths in the route should be ascertained by reference to the latest large-scale navigation charts of the area, noting that the charted depths are checked and maintained by frequent surveys and dredging.

2 *Electronic navigational aids*

(i) Uninterrupted differential GPS coverage is normally available in this area, so masters of deep draught ships equipped with GPS navigational systems can be informed continuously and highly accurately about the ship's deviation from and progress along the axis of the route.

(ii) Those ships which because of their draught are confined to the mid-channel zone are strongly advised to make use of the above equipment.

**ESTABLISHMENT OF A NEW RECOMMENDATORY AREA TO BE AVOIDED OFF THE NINGALOO COAST, WESTERN AUSTRALIA**

**Reference charts**

| **Electronic Navigational Charts (ENC)** | | | | | |
|---|---|---|---|---|---|
| **Number** | **Scale** | **Horizontal Datum** | **Vertical Datum** | **Title** | **Published** |
| AU322113 | 90000 | WG 84 | LAT | Western Australia – Jurabi Point to Low Point | 2008 |
| AU422114 | 180000 | WG 84 | LAT | Western Australia – Thevenard Island to North West Cape | 2008 |
| AU323113 | 180000 | WG 84 | LAT | Western Australia – Point Cloates | 2008 |
| AU230110 | 1500000 | WG 84 | LAT | Australia – Port Hedland to Geraldton | 2010 |

| **Paper Charts** | | | | | |
|---|---|---|---|---|---|
| **Number** | **Scale** | **Horizontal Datum** | **Vertical Datum** | **Title** | **Published** |
| AUS 72 | 50000 | WG 84 | LAT | Norwegian bay and Point Cloates | 2011 |
| AUS 745 | 150000 | WG 84 | LAT | North West Cape to Point Maud | 1985 |
| AUS 744 | 150000 | WG 84 | LAT | Exmouth Gulf and Approaches | 1984 |
| AUS 329 | 300000 | WG 84 | LAT | North West Cape to Point Cloates | 1967 |
| AUS 328 | 300000 | WG 84 | LAT | Montebello Islands to North West Cape | 1985 |
| AUS 4725 | 1500000 | WG 84 | LAT | North West Cape to Cape Leeuwin | 2010 |
| AX4723F | 1500000 | WG 84 | LAT | Java to North West Cape | 2011 |
| AUS 4723 | 1500000 | WG 84 | LAT | Java to North West Cape | 2010 |

**Description of the area to be avoided**

The area lies off the western Australian coast between latitudes 21º 47′.00 S and 22º 50′ S, extending between 3 and 12 nm to seaward of the High Water line.

In order to reduce the risk of a marine casualty and resulting pollution and damage to the sensitive marine environment off the Ningaloo Coast, all ships over 150 gross tonnage and ships engaged in towing operations, regardless of size, should avoid the area bounded by a line joining the geographical positions listed below.

| | | | | | |
|---|---|---|---|---|---|
| .1 | 21º 47′.00 S | 114º 09′.75 E | .6 | 21º 47′.00 S | 113º 50′.00 E |
| .2 | 21º 47′.00 S | 114º 12′.50 E | .7 | 22º 40′.00 S | 113º 29′.00 E |
| .3 | 21º 44′.00 S | 114º 12′.50 E | .8 | 22º 50′.00 S | 113º 33′.80 E |
| .4 | 21º 42′.00 S | 114º 10′.50 E | .9 | The coastline at 22º 50′.00 S | |
| .5 | 21º 42′.00 S | 114º 00′.00 E | .10 | Then along the coastline to (1) above | |

**NEW AREA TO BE AVOIDED BY SHIPS OF 300 GT OR OVER AND A MANDATORY NO ANCHORING AREA FOR ALL SHIPS AS ASSOCIATED PROTECTIVE MEASURES (APMS) FOR SABA BANK PSSA**

**Description of the mandatory no anchoring and an area to be avoided**

An area to be avoided by ships of 300 GT and over and a mandatory no anchoring area for all ships is established in the area designated as a Particularly Sensitive Sea Area and bounded by a line connecting the following geographical positions:

(Reference Chart: Netherlands 2020, Edition November 2007
***Note*:** This chart is based on World Geodetic System 1984 (WGS 84))

| | | |
|---|---|---|
| 1. | 17° 27′.06 N | 063° 56′.14 W |
| 2. | 17° 29′.00 N | 063° 55′.09 W |
| 3. | 17° 27′.94 N | 063° 43′.32 W |
| 4. | 17° 38′.03 N | 063° 27′.41 W |
| 5. | 17° 43′.35 N | 063° 32′.74 W |
| 6. | 17° 45′.98 N | 063° 29′.98 W |
| 7. | 17° 40′.34 N | 063° 21′.10 W |
| 8. | 17° 30′.88 N | 063° 10′.92 W |
| 9. | 17° 23′.80 N | 063° 11′.25 W |
| 10. | 17° 16′.27 N | 063° 15′.85 W |
| 11. | 17° 13′.44 N | 063° 26′.89 W |
| 12. | 17° 10′.55 N | 063° 41′.81 W |
| 13. | 17° 20′.85 N | 063° 49′.89 W |

**ESTABLISHMENT OF TWO NEW AREAS TO BE AVOIDED IN WATERS OFF THE BRAZILIAN SOUTH-EAST COAST**

(Reference charts: Brazil 22800, 2009 edition and Brazil 22900, 2008 edition;
***Note:*** These charts are based on WGS 84 datum.)

**Description of the areas to be avoided**

1 Golfinho Field

An area within the circle of 7 nautical miles radius centred on the following geographical position:

20º 00′ 10'' S 039º 34′ 45'' W

2 Jubarte Field

An area within the circle of 7.5 nautical miles radius centred on the following geographical position:

21º 16′ 25" S 040º 01′ 54" W

***Note:*** All vessels not engaged in offshore activities are requested to avoid these areas.

**REVOCATION OF THE DEEP-WATER ROUTE INSIDE THE BORDERS OF THE TRAFFIC SEPARATION SCHEME FROM GOGLAND ISLAND TO RODSHER ISLAND**

Positions are based on World Geodetic System 1984 Datum (WGS 84). The Russian Federation reference chart #23004 (Pulkovo). For obtaining position in WGS datum charted positions should be moved 0'.14 (8".3) westward.

The deep-water route with established direction of traffic flow within the borders of the traffic separation scheme from Gogland Island to Rodsher Island intended for the passage of ships with a draught up to 15 m is revoked.

**NEW RECOMMENDED TRACKS AND TRAFFIC SEPARATION LINE BETWEEN THE TRAFFIC SEPARATION SCHEMES "OFF RODSHER ISLAND" AND "OFF GOGLAND ISLAND"**

Positions are based on World Geodetic System 1984 Datum (WGS 84). The Russian Federation reference chart #23004 (Pulkovo). For obtaining position in WGS datum charted positions should be moved 0'.14 (8".3) westward.

**New recommended tracks and traffic separation line between traffic separation schemes "Off Rodsher Island" and "Off Gogland Island"**

Recommended tracks are eastbound and westbound traffic lanes separated by a traffic separation line connecting the following geographical positions:

1) 60º 00.10′ N, 026º 44.16′ E; and
2) 59º 59.00′ N, 026º 57.26′ E.

The traffic lanes are 1.25 miles wide.

**RECOMMENDATORY MEASURE FOR VESSELS CROSSING THE TRAFFIC SEPARATION SCHEME (TSS) AND PRECAUTIONARY AREAS IN THE SINGAPORE STRAIT DURING HOURS OF DARKNESS**

1 Vessels are recommended to display, if carried, the night signals consisting of three all-round green lights* in a vertical line in the following situations:

* The technical specifications of the lights used in the "three green lights" signal should, if possible, comply closely with positioning and technical details of lights in annex I of COLREG.

(a) vessels departing from ports or anchorages when crossing the westbound or eastbound lane of the TSS or precautionary areas in the Singapore Strait to join the eastbound or westbound lane respectively; and

(b) eastbound or westbound vessels in the TSS or precautionary areas in the Singapore Strait crossing to proceed to ports or anchorages in the Singapore Strait.

2 The night signals are recommended to be displayed by:

(a) vessels of 300 gross tonnage and above;

(b) vessels of 50 metres or more in length; and

(c) vessels engaged in towing or pushing with a combined 300 gross tonnage and above, or with a combined length of 50 metres or more.

3 Vessels crossing the TSS and precautionary areas in the Singapore Strait to proceed to or from ports or anchorages should comply with the following procedures:

(a) a vessel in the Singapore Strait which intends to cross the eastbound or westbound traffic lanes in the TSS or precautionary areas respectively should comply with the following:

(i) report to the VTIS to indicate its intention in advance, allowing VTIS to alert ships in the vicinity of the crossing vessel;

(ii) display the signals consisting of three all-round green lights in a vertical line in ample time prior to crossing in order for other vessels to note the intention to cross the TSS or precautionary areas;

(iii) when traffic conditions are favourable make a large alteration of course, if necessary, so as, to be readily apparent to other vessels in the vicinity observing visually or by radar and cross the traffic lane on a heading as nearly as practicable at right angles to the general direction of traffic flow; and

(iv) report to VTIS and switch off the night signals when it has safely left/crossed or joined the appropriate traffic lane.

(b) displaying the night signals does not exempt the crossing vessel of its obligations to comply with the COLREG.

***

## ANNEX 27

## RESOLUTION MSC.348(91)
**Adopted on 28 November 2012**

## ADOPTION OF A NEW MANDATORY SHIP REPORTING SYSTEM "IN THE BARENTS AREA (BARENTS SRS)"

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO regulation V/11 of the International Convention for the Safety of Life at Sea, 1974 (SOLAS Convention), in relation to the adoption of mandatory ship reporting systems by the Organization,

RECALLING FURTHER resolution A.858(20) resolving that the function of adopting ship reporting systems shall be performed by the Committee on behalf of the Organization,

TAKING INTO ACCOUNT the guidelines and criteria for ship reporting systems adopted by resolution MSC.43(64), as amended by resolutions MSC.111(73) and MSC.189(79),

HAVING CONSIDERED the recommendations of the Sub-Committee on Safety of Navigation at its fifty-eighth regular session,

1. ADOPTS in accordance with SOLAS regulation V/11, a new mandatory ship reporting system "In the Barents Area (Barents SRS)", as set out in the annex;

2. DECIDES that the above-mentioned new mandatory ship reporting system will enter into force at 0000 hours UTC on 1 June 2013;

3. REQUESTS the Secretary-General to bring this resolution and its annex to the attention of Contracting Governments to the SOLAS Convention and to members of the Organization.

ANNEX

**MANDATORY SHIP REPORTING SYSTEM "IN THE BARENTS AREA"
(BARENTS SRS)**

## 1 CATEGORIES OF SHIPS REQUIRED TO PARTICIPATE IN THE SYSTEM

1.1 The following categories of ships passing through or proceeding to and from ports and anchorages in the Barents SRS area are required to participate in the ship reporting system:

.1 all ships with a gross tonnage of 5,000 and above;

.2 all tankers;

.3 all ships carrying hazardous cargoes (paragraph 1.2 refers);

.4 a vessel towing when the length of the tow exceeds 200 metres; and

.5 any ship not under command, restricted in their ability to manoeuvre or having defective navigational aids.

1.2 The meaning of hazardous cargoes is as follows:

.1 goods classified in the International Maritime Dangerous Goods (IMDG Code);

.2 substances classified in chapter 17 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) and chapter 19 of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code);

.3 oils as defined in MARPOL Annex I;

.4 noxious liquid substances as defined in MARPOL Annex II;

.5 harmful substances as defined in MARPOL Annex III; and

.6 radioactive materials specified in the Code for the Safe Carriage of Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Wastes in Flasks on Board Ships (INF Code).

1.3 Ships not listed above may participate in the ship reporting system (SRS) on a voluntary basis.

## 2 GEOGRAPHICAL COVERAGE OF THE SYSTEM AND THE NUMBER AND EDITIONS OF THE REFERENCE CHART USED FOR DELINEATION OF THE SYSTEM

2.1 The geographical area covered by the reporting system Barents SRS is defined within the following coordinates and is also shown in the chartlet attached at appendix 1.

| Number | Latitude | Longitude |
|---|---|---|
| A – Norway | 67º 10´.00 N | Norwegian coast |
| B – Norway | 67º 10´.00 N | 008º 00´.00 E |
| C – Norway | 68º 15´.00 N | 009º 30´.00 E |
| D – Norway | 71º 15´.00 N | 019º 00´.00 E |
| E – Norway | 71º 50´.00 N | 024º 00´.00 E |
| F – Norway | 71º 50´.00 N | 028º 00´.00 E |
| G – the Russian Federation | 71º 00´.00 N | 033º 20´.00 E |
| H – the Russian Federation | the Russian Federation coast | 033º 20´.00 E |

2.2 The reference charts, which include the operational area of Barents SRS, are:

### 2.2.1 *Norwegian charts*

| No. | Title | Scale | Datum | Edition |
|---|---|---|---|---|
| 514 | Barentshavet | 1:2000000 | WGS 84 | 2011 |
| 311 | From Støtt to Andenes | 1:350000 | ED-50 | 1960 |
| 321 | From Andenes to Grøtsund | 1:200000 | ED-50 | 1936 |
| 322 | Fugløybanken-Lopphavet | 1:200000 | ED-50 | 1970 |
| 323 | From Sørøya to Nordkapp | 1:200000 | ED-50 | 1962 |
| 324 | From Nordkapp to Kjølnes | 1:200000 | ED-50 | 1959 |
| 325 | From Slettnes to Grense Jakobselv | 1:200000 | ED-50 | 1929 |

***Note:*** Position coordinates referred to the WGS 84 Datum should be plotted direct onto these charts, as the difference between the WGS 84 and ED 50 Datum is of no practical significance at the actual scale. The geographical positions, listed in the document are given in the WGS 84 Datum.

### 2.2.2 *Russian Federation charts*

| No. | Title | Scale | Datum | Edition |
|---|---|---|---|---|
| 10100 | South part of Barents Sea | 1:2000000 | Pulkovo 1942 | 2002 |
| 11024 | From North cape to Rybachyy inlet | 1:500000 | Pulkovo 1942 | 2003 |
| 11114 | From Rybachyy inlet to Kanin Nos | 1:500000 | Pulkovo 1942 | 1999 |
| 12000 | From Varde to cape Teriberskyy | 1:200000 | Pulkovo 1942 | 2002 |
| 12050 | From cape Tsypnavolok to cape Voroniy | 1:200000 | Pulkovo 1942 | 2006 |
| 12100 | From cape Kulneset to cape Tsypnavolok | 1:200000 | Pulkovo 1942 | 2004 |

***Note:*** Position coordinates in WGS 84 datum should be moved 0.4 seconds southward and 11.3 seconds eastward to agree with these charts.

## 3 FORMAT, CONTENT OF REPORTS, TIMES AND GEOGRAPHICAL POSITIONS FOR SUBMITTING REPORTS, AUTHORITY TO WHOM REPORTS SHOULD BE SENT AND AVAILABLE SERVICES

### 3.1 Procedures of reporting

3.1.1 All Barents SRS reports must be sent to either Vardø VTS centre or Murmansk VTS centre. Ships within the Norwegian monitoring area report to Vardø VTS centre and ships within the Russian Federation monitoring area report to Murmansk VTS centre. Reports shall be given using AIS (Automatic Information System), Norwegian shiprep website, e-mail, fax, SATCom, mobile phone, VHF voice or by a combination of these communication means. Details are given in appendices 2 and 3.

3.1.2 The use of correct and updated AIS information can accomplish the reporting requirements for designators A, B, C, E, F, I, O and W. Details are given in appendix 3.

### 3.2 Format

3.2.1 The mandatory ship report shall be drafted in accordance with the format shown in appendix 3, as well as resolution A.851(20).

### 3.3 Content

3.3.1 A report from a ship to Barents SRS by AIS, non-verbal means or by voice communication or combinations thereof must contain the following information; details are given in appendix 3.

| | |
|---|---|
| A | Name of ship, call sign, IMO identification number and MMSI |
| B | Date and time |
| C | Position expressed in latitude and longitude |
| E | True course |
| F | Speed in knots |
| H | Date, time (UTC) and point of entry into Barents SRS area |
| I | Destination and ETA |
| O | Maximum present draught |
| P | Hazardous cargo, class and quantity |
| Q | Brief details of defects or restrictions in maneuverability |
| T | Contact information (shipowner and representative) |
| W | Total number of persons on board |
| X | Characteristics and total quantity of bunkers in metric tonnes |

***Note:*** The master of the ship must forthwith inform the Barents SRS VTS centre concerned of any change in navigational status or in previous information notified, particularly in relation to designator Q.

3.3.2 Proprietary information obtained as a requirement of the mandatory ship reporting system Barents SRS will be protected under this system consistent with the *General Principles for ship reporting systems and ship reporting requirements, including guidelines for reporting incidents involving dangerous goods, harmful substances and/or marine pollutants* (resolution A.851(20)).

### 3.4 Geographical position for submitting reports

3.4.1 Ships entering the Barents SRS operational area shall submit a report when entering into the area or on departure from a port or anchorage within the operational area.

3.4.2 Reports forwarded prior to entering the area can be submitted at any time after entering the Norwegian Economic Zone or the Russian Federation Exclusive Economic Zone and until one hour before entering the Barents SRS operational area. As the Vessel Traffic Services must be able to handle incoming prior reporting, it will not be possible to undertake pre-entry reports any later than one hour prior to entering the area.

3.4.3 Ships departing a port or leaving an anchorage within the Barents SRS area, may also submit a pre-entry report for designators H, P, T, Q and X if transmitted one hour prior to departure.

### 3.5 Authority

The Federal Agency of Maritime and River Transport and the Norwegian Coastal Administration are the VTS authorities for Murmansk VTS centre and Vardø VTS centre respectively which operate the Barents SRS Ship Reporting System.

## 4 INFORMATION TO BE PROVIDED TO SHIPS AND PROCEDURES TO BE FOLLOWED

4.1 Ships in the Barents SRS area are required to keep a continuous listening watch on VHF channel 16.

4.2 If requested, the VTS centre concerned shall provide ships with information about positioning, weather forecast, navigational warnings and other hazards in the ship reporting area, from broadcasting devices set up in the coastal States or by other available communication means concurred by involved participants.

4.3 If necessary, the VTS centre can provide individual information to a ship particularly in relation to positioning or local conditions.

4.4 If a ship needs to anchor due to breakdown, low visibility, adverse weather, etc., the VTS centre concerned can recommend suitable anchorages or other places of refuge within the operational area.

## 5 COMMUNICATION REQUIRED FOR THE BARENTS SRS SYSTEM

5.1 The language used for communication shall be English, using IMO Standard Marine Communication Phrases, when deemed necessary by the VTS centre concerned.

5.2 Details of communication and contact information are given in appendix 2.

## 6 RULES, REGULATIONS AND RECOMMENDATIONS IN FORCE IN THE AREA OF THE SYSTEM

### 6.1 Regulations for preventing collisions at sea

The Convention on the International Regulations for Preventing Collisions at Sea, 1972, as amended (COLREG) are applicable throughout the operational area of Barents SRS.

### 6.2 Traffic separation schemes

The traffic separation schemes off the coast of Norway from Vardø to Røst are in the operational area of Barents SRS. They have been adopted by IMO and Rule 10 of the International Regulations for Preventing Collisions at Sea applies.

### 6.3 Hazardous cargo

6.3.1 The meaning of hazardous cargo is stated in paragraph 1.2 and in resolution MSC.43(64), paragraph 1.4.

6.3.2 Ships carrying hazardous cargoes within the SRS operational area must comply with international and national regulations. The SRS does not relieve ship masters of their responsibility to provide nationally required reports and information to customs authorities.

6.3.3 Discharges of oil and ship-generated waste are monitored jointly by the Russian Federation and Norwegian Authorities.

## 7 SHORE-BASED FACILITIES TO SUPPORT THE OPERATION OF THE SYSTEM

### 7.1 Sensors, System and communication facilities

7.1.1 Murmansk VTS centre and Vardø VTS centre are equipped with multiple source information processing and retrieval systems, VHF radio, Automatic Identification System (AIS) and Long Range Identification and Tracking (LRIT) facilities.

7.1.2 Both centres have recording equipment to store information regarding a ships transit. In case of an incident, the VTS Authority can use records as evidence.

### 7.2. Personnel qualifications and training

The Murmansk VTS centre and Vardø VTS centre are both operated by trained and experienced personnel according to national requirements and recommendations by IMO.

### 7.3. Manning

Murmansk VTS centre and Vardø VTS centre are both manned 24 hours per day, 365 (366) days per year.

## 8 INFORMATION CONCERNING THE APPLICABLE PROCEDURES IF THE COMMUNICATION FACILITIES OF THE SHORE-BASED AUTHORITY FAIL

8.1 The Murmansk VTS centre and Vardø VTS centre are both designed with sufficient system redundancy to cope with normal equipment failure.

8.2 If essential equipment suffers breakdown, and sufficient operational capability cannot be maintained by backup systems, information on reduced operational capability will be given by the affected VTS centre as needed or broadcasted as a national navigational warning.

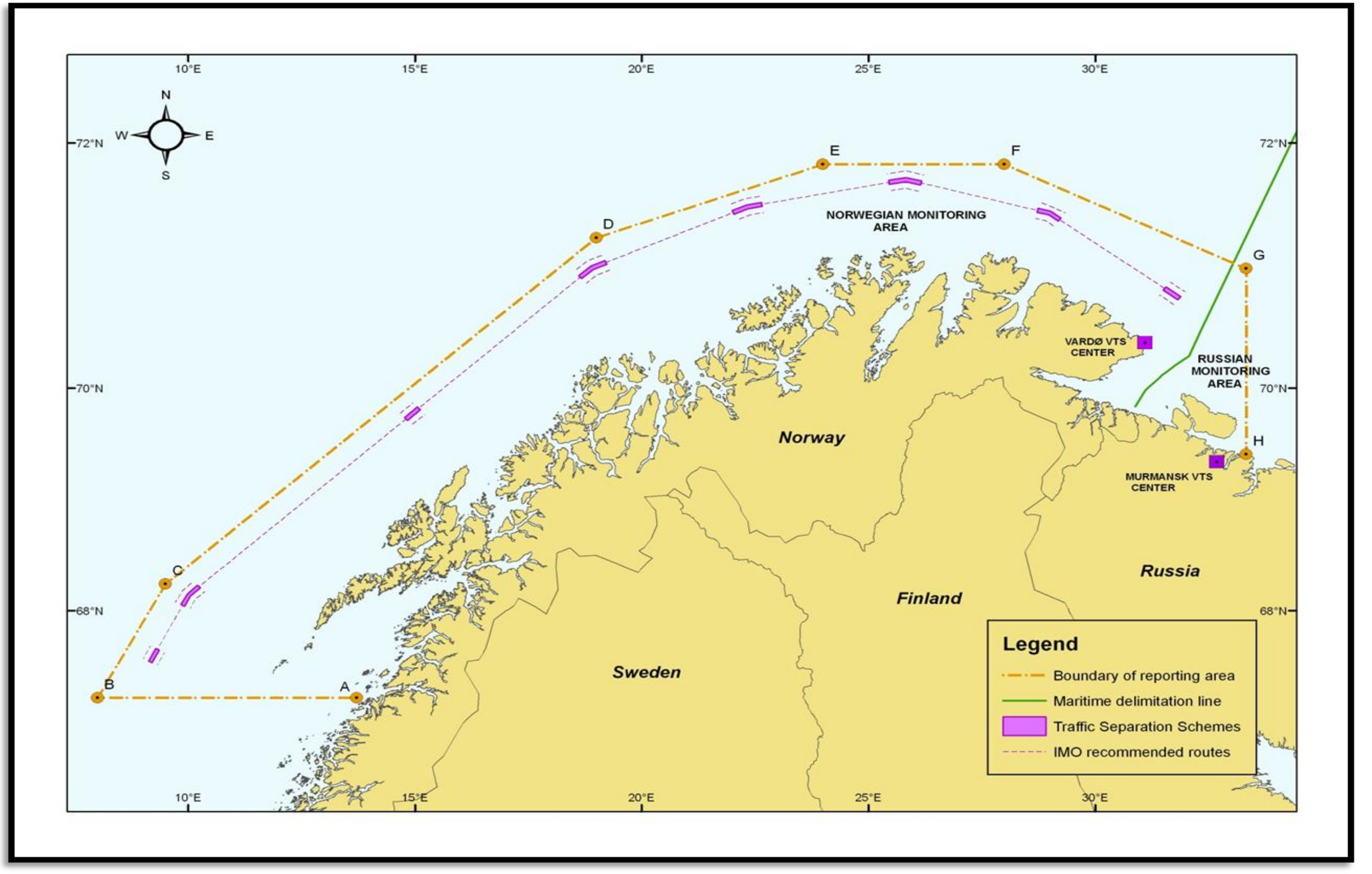
**9 MEASURES TO BE TAKEN IF A SHIP FAILS TO COMPLY WITH THE REQUIREMENTS OF THE SYSTEM**

9.1 The main objective of the system is to facilitate the exchange of information between the ships and the shore in order to support safe navigation and protect the marine environment. The system will also contribute to providing information to relevant SAR authorities.

9.2 All means will be used to encourage and promote the full participation of ships required to submit reports under SOLAS regulation V/11. If reports are not submitted and the offending ship can be positively identified, then information will be passed on to the relevant flag State Authorities for investigation and possible prosecution in accordance with national legislation. The mandatory ship reporting system Barents SRS is for the exchange of information only and does not provide any additional authority for mandating changes in the vessel's operations. The reporting system will be implemented consistent with UNCLOS, SOLAS and other relevant international instruments so that the reporting system will not provide the basis to impinge on a transiting vessel's passage through the Reporting Area.

## Appendix 1

## CHART OF THE BARENTS SRS OPERATIONAL AREA



## Appendix 2

## CONTACT INFORMATION AND OTHER RELEVANT INFORMATION IN RELATION TO THE VTS CENTRES TO WHICH THE REPORTS MUST BE SUBMITTED

### 1 CONTACT INFORMATION

1.1 Murmansk VTS centre can be contacted by e-mail, VHF or fax

VHF: Call "Murmansk Traffic" (channel 12)
MMSI: 002734484 or 002734466
E-mail: vts@mf-rmp.ru
Fax: +7 8152 479026

1.2 Vardø VTS centre can be contacted by VHF, e-mail, fax or telephone

VHF: Call Norwegian Coastal Radio Station and request "NOR VTS" (channel 16)
MMSI: 002573550
E-mail: nor.vts@kystverket.no
Fax: +47 78 98 98 99
Telephone: +47 78 98 98 98

### 2 SUBMISSION OF REPORTS

2.1 Ships within the Russian Federation monitoring area or the Russian Federation Exclusive Economic Zone report to Murmansk VTS centre primarily by e-mail, fax and AIS, alternatively VHF or a combination of these communication means.

2.2 Ships within the Norwegian monitoring area or Norwegian Economic Zone report to Vardø VTS centre primarily by the Norwegian Ship Reporting System at website: www.shiprep.no. Alternatively by AIS, e-mail, fax, telephone and VHF or a combination of these communication means.

## Appendix 3

## DRAFTING OF REPORTS TO THE MANDATORY SHIP REPORTING SYSTEM "BARENTS SRS"

### Summary

Reporting can be done by non-verbal means by the use of AIS and pre-entry non-verbal means as, for example, e-mail, fax or the website www.shiprep.no. If a ship is unable to make use of the non-verbal means or submit a report at least one hour prior to entering the area, reporting is to be done by VHF or by telephone (if outside VHF range).

- Correct and updated AIS information can accomplish reporting of designators A, B, C, E, F, I, O and W.

- Non-verbal means can accomplish reporting of designators A, H, P, Q, T and X.

The scheme below gives the preferred method of reporting combined by AIS, non-verbal means and VHF, as well as information required for each designator.

| Designator | AIS | Non-verbal | VHF | Function | Information required |
|---|---|---|---|---|---|
| **A** | Yes | Yes | Yes | Ship | 1) Name of ship<br>2) MMSI number<br>3) Call sign<br>and – when available –<br>4) IMO number<br>5) Additional contact information. |
| **B** | Yes | | | Date and time | A 6-digit group-giving day of month and hours and minutes in Universal Coordinated Time (UTC). |
| **C** | Yes | | | Position | A 5-digit group giving latitude in degrees and minutes, decimal, suffixed with N (north) and a 6-digit group giving longitude in degrees and minutes, decimal, suffixed with E (east) or W (west). |
| **E** | Yes | | | True course | A 3-digit group. |
| **F** | Yes | | | Speed in knots and tenths of knots | A 3-digit group. |

| Designator | AIS | Non-verbal | VHF | Function | Information required |
|---|---|---|---|---|---|
| **I** | Yes | | | Destination and ETA | The name of next port of call given in UN LOCODE by AIS. For details and procedures see IMO SN/Circ.244 and www.unece.org/cefact/locode/service/main.htm.<br>ETA date and time group expressed as in (B). |
| **H** | | Yes | | Date, time and point of entry into the Barents SRS area | This information is only required if reporting designators P, T and X are transmitted non-verbally (e.g. e-mail) prior to entry of the Barents SRS.<br>Entry date and time expressed as in (B) and position expressed as in (C). |
| **O** | Yes | | | Maximum present draught in metres | A 2-digit or 3-digit group giving the present maximum draught in metres (e.g. 6.1 or 10.4). |
| **P** | | Yes | | Cargo on board | Cargo and, if hazardous goods present on board, quantity and IMO class (inclusive UN code). Hazardous goods information must be summarized in total tonnes per IMO class when transmitted. |
| **Q** | | Yes | | Defects and deficiencies | Q: Details of defects and deficiencies affecting the equipment of the ship or any other circumstances affecting normal navigation and manoeuvrability. |
| **T** | | Yes | | Ship's owner and represen-tative | Address and particulars from which detailed information on the cargo may be obtained. |
| **W** | Yes | | | Total number of persons on board | State number |
| **X** | | Yes | | Miscella-neous | Type and estimated quantity of bunker fuel in metric tonnes. Must be summarized in total tonnes per type when transmitted. |

***

# ANNEX 28

## DRAFT MSC RESOLUTION

## ADOPTION OF PERFORMANCE STANDARDS FOR ELECTRONIC INCLINOMETERS

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO resolution A.886(21), by which the Assembly resolved that the function of adopting performance standards and technical specifications, as well as amendments thereto shall be performed by the Maritime Safety Committee and/or the Marine Environment Protection Committee, as appropriate, on behalf of the Organization,

NOTING that, in the *Revised guidance to the master for avoiding dangerous situations in adverse weather and sea conditions* (MSC.1/Circ.1228), the information about heel angle and roll period is regarded as relevant for assessment of ship's stability situation in adverse weather and sea conditions,

NOTING ALSO that, at its ninetieth session, it had adopted resolution MSC.333(90) on *Revised performance standards for shipborne voyage data recorders* (VDRs), including the recommendation that, with regard to the rolling motion, a VDR should be connected to an electronic inclinometer or, if not installed, be equipped with, or connected to, a suitable motion sensor with an equivalent measurement performance,

NOTING FURTHER that, at its eighty-eighth session, instead of adding the requirement for an electronic inclinometer to the performance standards for VDRs, it had decided to develop dedicated performance standards for inclinometers,

RECOGNIZING the need to define minimum requirements for a heel angle and roll period measurement device to ensure that heeling information is provided in a reliable manner on board ships to be used by the crew to assess the dynamic situation of the ship and to be available for marine casualty investigations,

HAVING CONSIDERED, at its [ninety-second] session, the draft Performance standards for electronic inclinometers, prepared by the Sub-Committee on Safety of Navigation, at its fifty-eighth session,

1. ADOPTS the *Performance standards for electronic inclinometers*, set out in the annex to the present resolution;

2. RECOMMENDS Governments ensure that electronic inclinometers, installed on or after [1 July 2015], conform to performance standards not inferior to those specified in the annex to the present resolution.

ANNEX

**PERFORMANCE STANDARDS FOR ELECTRONIC INCLINOMETERS**

## 1 SCOPE

1.1 Electronic inclinometers are intended to support the decision-making process on board in order to avoid dangerous situations as well as assist in and facilitate maritime casualty investigations by providing information about the roll period and the heel angle of the ship.

Electronic inclinometers should in a reliable form:

.1 determine the actual heel angle with the required accuracy;

.2 determine the roll amplitude with the required accuracy;

.3 determine the roll period with the required accuracy;

.4 present the information on a bridge display; and

.5 provide a standardized interface to instantaneous heel angle to the VDR.

## 2 APPLICATION OF THESE STANDARDS

2.1 These Performance standards should apply to all electronic inclinometers intended to support the decision-making process on board in order to avoid dangerous situations as well as to assist in maritime casualty investigations, if carried, on all ships[1].

2.2 In addition to the general requirements set out in resolution A.694(17)[2] and the presentation requirements set out in resolution MSC.191(79), electronic inclinometers should meet the requirements of these Standards and follow the relevant guidelines on ergonomic principles[3] adopted by the Organization.

## 3 DEFINITIONS

3.1 For the purpose of these Performance standards:

| | |
|---|---|
| Rolling: | motion around the longitudinal axis of the ship |
| Actual heel angle: | momentary angle of roll referenced to a levelled ship to port or starboard side |
| Roll period: | time between two successive maximum values of heel angle on the same side of the ship |
| Roll amplitude: | maximum values of heel angle to port or starboard side |

1 These performance standards do not apply to Electronic inclinometers installed for purposes which are outside the scope of these guidelines, e.g. monitoring of cargo status.

2 Refer to publication IEC 60945 – Maritime navigation and radiocommunication equipment and systems – General requirements.

3 Guidelines on ergonomic criteria for bridge equipment and layout (MSC/Circ.982).

## MODULE A – SENSOR

### 4 MEASUREMENT OF ACTUAL HEEL ANGLE

Electronic inclinometers should be capable of measuring the actual heel angle and determining the amplitude of the rolling oscillation of the ship over a range of ±90º.

### 5 MEASUREMENT OF ROLL PERIOD

Electronic inclinometers should be capable of measuring the time between the maximum values of the rolling oscillation and determining the roll period over a minimum range of 4 to 40 s.

### 6 ACCURACY

6.1 Electronic inclinometers should provide the data with sufficient accuracy for a proper assessment of the ship's dynamic situation. Minimum accuracy of the measurements should be 5 per cent of reading or ± 1 degree whichever is the greater for angle measurements and 5 per cent of reading or ± 1 second whichever is the greater for time measurements.

6.2 Actual heel angle and time measurement accuracy should not be unduly affected by other linear or rotational movements of the vessel (as e.g. surging, swaying, heaving, pitching, yawing) or by transverse acceleration ranging from -0.8 g to +0.8 g.

## MODULE B – OPERATIONAL AND FUNCTIONAL REQUIREMENTS

### 7 DISPLAY REQUIREMENTS

7.1 Electronic inclinometers should display:

.1 the roll period with a minimum resolution of 1 s; and

.2 the roll amplitude to both port and starboard side with a minimum resolution of 1º.

7.2 The actual heel angle to port or starboard should be indicated in an analogue form between the limits of ±45º.

7.3 The display may be implemented as a dedicated display or integrated into other bridge systems.

### 8 OPERATIONAL ALERTS

8.1 Electronic inclinometers may optionally provide a warning for parametric roll[4] and/or synchronous rolling detection.

8.2 Electronic inclinometers may optionally provide a warning for indicating that a set heel angle had been exceeded.

[4] Refer to the *Revised guidance to the master for avoiding dangerous situations in adverse weather and sea conditions* (MSC.1/Circ.1228).

## 9 PERFORMANCE TESTS, MALFUNCTIONS AND INDICATIONS

Electronic inclinometers should internally check and indicate to the user if all components are operative and if the information provided is valid or not.

## MODULE C – INTERFACING AND INTEGRATION

## 10 CONNECTIONS TO OTHER EQUIPMENT

10.1 Electronic inclinometers should comprise a digital interface providing actual heel angle information to other systems like e.g. the voyage data recorder (VDR) with an update rate of at least 5 Hz. Electronic inclinometers should also comprise a digital interface providing the displayed information of roll period and roll amplitude (paragraph 7.1 refers).

10.2 Electronic inclinometers should have a bidirectional interface to facilitate communication, to transfer alerts from inclinometers to external systems and to acknowledge and silence alerts from external systems.

10.3 The digital interface should be compliant to the relevant international standards[5].

## 11 INSTALLATION POSITION

The installation position of the sensors of the electronic inclinometer should be recorded and made available for the configuration of the voyage data recorder.

## 12 POWER SUPPLY

Electronic inclinometers should be powered from the ship's main source of electrical energy. In addition, it should be possible to operate the Electronic inclinometers from the ship's emergency source of electrical energy.

***

5 Refer to publication IEC 61162 – Maritime navigation and radiocommunication equipment and systems – Digital interfaces.

## ANNEX 29

## DRAFT AMENDMENTS TO SOLAS CHAPTER III

**Regulation 19 – Emergency training and drills**

1 After the existing paragraph 3.2, new paragraph 3.3 is inserted as follows:

"3.3 Crew members with enclosed space entry or rescue responsibilities shall participate in an enclosed space entry and rescue drill to be held on board the ship at least once every two months."

2 Existing sections 3.3 and 3.4 are renumbered as 3.4 and 3.5, respectively.

3 After the renumbered section 3.5, the following new paragraph is added:

"3.6 Enclosed space entry and rescue drills

3.6.1 Enclosed space entry and rescue drills should be planned and conducted in a safe manner, taking into account, as appropriate, the guidance provided in the recommendations developed by the Organization*.

3.6.2 Each enclosed space entry and rescue drill shall include:

.1 checking and use of personal protective equipment required for entry;

.2 checking and use of communication equipment and procedures;

.3 checking and use of rescue equipment and procedures; and

.4 instructions in first aid and resuscitation techniques."

4 In paragraph 4.2, after subparagraph .4, the following new subparagraph is added:

".5 risks associated with enclosed spaces and onboard procedures for safe entry into such spaces which should take into account, as appropriate, the guidance provided in recommendations developed by the Organization*."

5 In paragraph 5, after the words "fire drills,", the words "enclosed space entry and rescue drills," are inserted.

***

* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27).

## ANNEX 30

## DRAFT AMENDMENTS TO THE 1994 HSC CODE

## CHAPTER 18
## OPERATIONAL REQUIREMENTS

1 After existing paragraph 18.5.3, a new paragraph is inserted as follows:

"18.5.4 Crew members with enclosed space entry or rescue responsibilities shall participate in an enclosed space entry and rescue drill, to be held on board the craft, at least once every two months."

2 The existing paragraphs 18.5.4 to 18.5.10 are renumbered as 18.5.5 to 18.5.11, respectively.

3 The renumbered paragraph 18.5.8.1 is amended to read:

"18.5.8.1 Records

The date when musters are held, details of abandon craft drills and fire drills, drills of other life-saving appliances, enclosed space entry and rescue drills, and onboard training shall be recorded in such log-book as may be prescribed by the Administration."

4 After renumbered paragraph 18.5.11, a new section is inserted as follows:

"18.5.12 Enclosed space entry and rescue drills

18.5.12.1 Enclosed space entry and rescue drills should be planned and conducted in a safe manner, taking into account, as appropriate, the guidance provided in the recommendations developed by the Organization*.

18.5.12.2 Each enclosed space entry and rescue drill shall include:

.1 checking and use of personal protective equipment required for entry;

.2 checking and use of communication equipment and procedures;

.3 checking and use of rescue equipment and procedures; and

.4 instructions in first aid and resuscitation techniques.

18.5.12.3 The risks associated with enclosed spaces and onboard procedures for safe entry into such spaces which should take into account, as appropriate, the guidance provided in recommendations developed by the Organization*."

***

* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27).

## ANNEX 31

## DRAFT AMENDMENTS TO THE 2000 HSC CODE

## CHAPTER 18
## OPERATIONAL REQUIREMENTS

1 After existing paragraph 18.5.3, a new paragraph is inserted as follows:

"18.5.4 Crew members with enclosed space entry or rescue responsibilities shall participate in an enclosed space entry and rescue drill, to be held on board the craft, at least once every two months."

2 The existing paragraphs 18.5.4 to 18.5.10 are renumbered as 18.5.5 to 18.5.11, respectively.

3 The renumbered paragraph 18.5.8.1 is amended to read:

"18.5.8.1 Records

The date when musters are held, details of abandon craft drills and fire drills, drills of other life-saving appliances, enclosed space entry and rescue drills, and onboard training shall be recorded in such log-book as may be prescribed by the Administration."

4 After renumbered paragraph 18.5.11, a new paragraph is inserted as follows:

"18.5.12 Enclosed space entry and rescue drills

18.5.12.1 Enclosed space entry and rescue drills should be planned and conducted in a safe manner, taking into account, as appropriate, the guidance provided in the recommendations developed by the Organization*.

18.5.12.2 Each enclosed space entry and rescue drill shall include:

.1 checking and use of personal protective equipment required for entry;

.2 checking and use of communication equipment and procedures;

.3 checking and use of rescue equipment and procedures; and

.4 instructions in first aid and resuscitation techniques.

18.5.12.3 The risks associated with enclosed spaces and onboard procedures for safe entry into such spaces which should take into account, as appropriate, the guidance provided in recommendations developed by the Organization*."

***

* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27).

# ANNEX 32

## DRAFT AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR SAFE CONTAINERS (CSC), 1972

## ANNEX I
## REGULATIONS FOR THE TESTING, INSPECTION, APPROVAL AND MAINTENANCE OF CONTAINERS

### Chapter I
### Regulations common to all systems of approval

1 After the heading of chapter I, insert the following:

"**General Provisions**

Notwithstanding definitions in paragraphs 14 to 16 of article II, the definitions as given in annex IV shall be applied for the purpose of the present Convention."

**Regulation 1** – **Safety Approval Plate**

2 Subparagraph 1(b) of regulation 1 is amended to read:

"(b) On each container, all maximum operating gross mass markings shall be consistent with the maximum operating gross mass information on the Safety Approval Plate.";

subparagraph 2(a) is amended to read:

"(a) The plate shall contain the following information in at least the English or French language:

"CSC SAFETY APPROVAL"
Country of approval and approval reference
Date (month and year) of manufacture
Manufacturer's identification number of the container or, in the case of existing containers for which that number is unknown, the number allotted by the Administration
Maximum operating gross mass (kg and lbs)
Allowable stacking load for 1.8 g (kg and lbs)
Transverse racking test force (newtons)";

at the end of paragraph 3, a new text is added as follows:

", at or before their next scheduled examination or before any other date approved by the Administration, provided this is not later than 1 July 2015.";

and a new paragraph 5 is added as follows:

"5 A container, the construction of which was completed prior to [1 July 2014], may retain the Safety Approval Plate as permitted by the Convention prior to that date as long as no structural modifications occur to that container.".

## Chapter IV
## Regulations for approval of existing containers and new containers not approved at time of manufacture

**Regulation 9 – Approval of existing containers**

3 Subparagraphs 1(c) and 1(e) of regulation 9 are amended to read:

"(c) maximum operating gross mass capability;"

"(e) allowable stacking load for 1.8 g (kg and lbs); and"

**Regulation 10 – Approval of new containers not approved at time of manufacture**

4 Subparagraphs (c) and (e) of regulation 10 are amended to read:

"(c) maximum operating gross mass capability;"

"(e) allowable stacking load for 1.8 g (kg and lbs); and"

## Appendix

5 The fourth, fifth and sixth lines of the model of the Safety Approval Plate reproduced in the appendix are amended to read:

"MAXIMUM OPERATING GROSS MASS ........ kg ........ lbs
ALLOWABLE STACKING LOAD FOR 1.8 g ........ kg ........ lbs
TRANSVERSE RACKING TEST FORCE ........ newtons"

6 Items 4 to 8 of the appendix are amended to read:

"4 Maximum operating gross mass (kg and lbs).

5 Allowable stacking load for 1.8 g (kg and lbs).

6 Transverse racking test force (newtons).

7 End-wall strength to be indicated on plate only if end-walls are designed to withstand a force of less or greater than 0.4 times the gravitational force by maximum permissible payload, i.e. 0.4Pg.

8 Side-wall strength to be indicated on plate only if the side-walls are designed to withstand a force of less or greater than 0.6 times the gravitational force by maximum permissible payload, i.e. 0.6Pg."

7 The existing paragraphs 10 and 11 are replaced as follows:

"10 One door off stacking strength to be indicated on plate only if the container is approved for one door off operation. The marking shall show: ALLOWABLE STACKING LOAD ONE DOOR OFF FOR 1.8 g (... kg ... lbs). This marking shall be displayed immediately near the stacking test value (see line 5).

11 One door off racking strength to be indicated on plate only if the container is approved for one door off operation. The marking shall show: TRANSVERSE RACKING TEST FORCE (... newtons). This marking shall be displayed immediately near the racking test value (see line 6)."

## ANNEX II
## STRUCTURAL SAFETY REQUIREMENTS AND TESTS

8 After the heading of chapter II, insert the following:

"**General Provisions**

Notwithstanding definitions in paragraphs 14 to 16 of article II, the definitions as given in Annex IV shall be applied for the purpose of the present Convention."

9 The first sentence of the Introduction to annex II (Structural safety requirements and tests) is amended to read:

"In setting the requirements of this annex, it is implicit that, in all phases of the operation of containers, the forces as a result of motion, location, stacking and gravitational effect of the loaded container and external forces will not exceed the design strength of the container."

10 In section 1 – LIFTING –, subsection 1(A) – Lifting from corner fittings, the text concerning test loadings and applied forces is amended to read:

"TEST LOAD AND APPLIED FORCES

**Internal load:**

A uniformly distributed load such that the sum of the mass of container and test load is equal to 2R. In the case of a tank-container, when the test load of the internal load plus the tare is less than 2R, a supplementary load, distributed over the length of the tank, is to be added to the container.

**Externally applied forces:**

Such as to lift the sum of a mass of 2R in the manner prescribed (under the heading TEST PROCEDURES)."

11 In section 1 – LIFTING –, subsection 1(B) – Lifting by any other additional methods – is replaced by the following:

"TEST LOAD AND APPLIED FORCES

**Internal load:**

A uniformly distributed load such that the sum of the mass of container and test load is equal to 1.25R.

**Externally applied forces:**

Such as to lift the sum of a mass of 1.25R in the manner prescribed (under the heading TEST PROCEDURES).

TEST PROCEDURES

(i) *Lifting from fork-lift pockets:*

The container shall be placed on bars which are in the same horizontal plane, one bar being centred within each fork-lift pocket which is used for lifting the loaded container. The bars shall be of the same width as the forks intended to be used in the handling, and shall project into the fork pocket 75% of the length of the fork pocket.

**Internal load:**
A uniformly distributed load such that the sum of the mass of container and test load is equal to 1.25R. In the case of a tank container, when the test load of the internal load plus the tare is less than 1.25R, a supplementary load, distributed over the length of the tank, is to be added to the container.

**Externally applied forces:**

Such as to lift the sum of a mass of 1.25R in the manner prescribed (under the heading TEST PROCEDURES).

(ii) *Lifting from grappler-arm positions:*
The container shall be placed on pads in the same horizontal plane, one under each grappler-arm position. These pads shall be of the same sizes as the lifting area of the grappler arms intended to be used.

iii) *Other methods:*

Where containers are designed to be lifted in the loaded condition by any method not mentioned in (A) or (B)(i) and (ii) they shall also be tested with the internal load and externally applied forces representative of the acceleration conditions appropriate to that method."

12 Paragraphs 1 and 2 of section 2 – STACKING – are amended to read:

"1 For conditions of international transport where the maximum vertical acceleration varies significantly from 1.8 g and when the container is reliably and effectively limited to such conditions of transport, the stacking load may be varied by the appropriate ratio of acceleration.

2 On successful completion of this test, the container may be rated for the allowable superimposed static stacking load, which should be indicated on the Safety Approval Plate against the heading ALLOWABLE STACKING LOAD FOR 1.8 g (kg and lbs)."

13 In section 2 – STACKING, the text concerning test loadings and applied forces is amended to read:

"TEST LOAD AND APPLIED FORCES

**Internal load:**

A uniformly distributed load such that the sum of the mass of container and test load is equal to 1.8R. Tank-containers may be tested in the tare condition.

**Externally applied forces:**

Such as to subject each of the four top corner fittings to a vertical downward force equal to 0.25 x 1.8 x the gravitational force of the allowable superimposed static stacking load."

14 Section 3 – CONCENTRATED LOADS – is amended to read:

"TEST LOAD AND APPLIED FORCES | TEST PROCEDURES

**(a) On roof**

| TEST LOAD AND APPLIED FORCES | TEST PROCEDURES |
|---|---|
| **Internal load:**<br><br>None.<br><br>**Externally applied forces:**<br><br>A concentrated gravitational force of 300 kg (660 lbs) uniformly distributed over an area of 600 mm x 300 mm (24 in x 12 in). | The externally applied forces shall be applied vertically downwards to the outer surface of the weakest area of the roof of the container. |

**(b) On floor**

| TEST LOAD AND APPLIED FORCES | TEST PROCEDURES |
|---|---|
| **Internal load:**<br><br>Two concentrated loads each of 2,730 kg (6,000 lbs) and each added to the container floor within a contact area of 142 $cm^2$ (22 sq in).<br><br>**Externally applied forces:**<br><br>None | The test should be made with the container resting on four level supports under its four bottom corners in such a manner that the base structure of the container is free to deflect.<br><br>A testing device loaded to a mass of 5,460 kg (12,000 lbs), that is, 2,730 kg (6,000 lbs) on each of two surfaces, having, when loaded, a total contact area of 284 $cm^2$ (44 sq in), that is, 142 $cm^2$ (22 sq in) on each surface, the surface width being 180 mm (7 in) spaced 760 mm (30 in) apart, centre to centre, should be manoeuvred over the entire floor area of the container." |

15 The heading and subheading of the text concerning these loadings and applied forces in section 4 – TRANSVERSE RACKING – are replaced by the following, respectively:

"TEST LOAD AND APPLIED FORCES" and "**Internal load:**".

16 In section 5 – LONGITUDINAL RESTRAINT (STATIC TEST), the text concerning test loadings and applied forces is amended to read:

"TEST LOAD AND APPLIED FORCES

**Internal load:**

A uniformly distributed load, such that the sum of the mass of a container and test load is equal to the maximum operating gross mass or rating R. In the case of a tank-container, when the mass of the internal load plus the tare is less than the maximum gross mass or rating, R, a supplementary load is to be added to the container.

**Externally applied forces:**
Such as to subject each side of the container to longitudinal compressive and tensile forces of magnitude Rg, that is, a combined force of 2Rg on the base of the container as a whole."

17 The first paragraph of section 6 – END-WALLS – is amended to read:

"The end-walls should be capable of withstanding a force of not less than 0.4 times the force equal to gravitational force by maximum permissible payload. If, however, the end-walls are designed to withstand a force of less or greater than 0.4 times the gravitational force by maximum permissible payload, such a strength factor shall be indicated on the Safety Approval Plate in accordance with annex I, regulation 1."

18 In section 6 – END-WALLS, the text concerning test loadings and applied forces is amended to read:

"TEST LOAD AND APPLIED FORCES

**Internal load:**

Such as to subject the inside of an end-wall to a uniformly distributed force of 0.4Pg or such other force for which the container may be designed.

**Externally applied forces:**

None."

19 The first paragraph of section 7 – SIDE-WALLS – is amended to read:

"The side-walls should be capable of withstanding a force of not less than 0.6 times the force equal to the gravitational force by maximum permissible payload. If, however, the side-walls are designed to withstand a force of less or greater than 0.6 times the gravitational force by maximum permissible payload, such a strength factor shall be indicated on the Safety Approval Plate in accordance with annex I, regulation 1."

20 In section 7 – SIDE-WALLS, the text concerning test loadings and applied forces is amended to read:

"TEST LOAD AND APPLIED FORCES

**Internal load:**

Such as to subject the inside of a side-wall to a uniformly distributed force of 0.6Pg or such other force for which the container may be designed.

**Externally applied forces:**

None."

21 The existing section 8 – ONE DOOR OFF OPERATION – is replaced by the following:

"**8 ONE DOOR OFF OPERATION**

8.1 Containers with one door removed have a significant reduction in their ability to withstand racking forces and, potentially, a reduction in stacking strength.

The removal of a door on a container in operation is considered a modification of the container. Containers must be approved for one door off operation. Such approval shall be based on test results as set forth below.

8.2 On successful completion of the stacking test the container may be rated for the allowable superimposed stacking load, which shall be indicated on the Safety Approval Plate immediately below line 5: ALLOWABLE STACKING LOAD FOR 1.8 g (kg and lbs) ONE DOOR OFF.

8.3 On successful completion of the racking test the transverse racking test force shall be indicated on the Safety Approval Plate immediately below line 6: TRANSVERSE RACKING TEST FORCE ONE DOOR OFF (newtons).

| TEST LOAD AND APPLIED FORCES | TEST PROCEDURES |
|---|---|
| **<u>Stacking</u>** | |
| **Internal load:**<br>A uniformly distributed load such that the sum of the mass of container and test load is equal to 1.8R. | The test procedures shall be as set forth under **2 STACKING** |
| **Externally applied forces:**<br>Such as to subject each of the four top corner fittings to a vertical downward force equal to 0.25 x 1.8 x the gravitational force of the allowable superimposed static stacking load. | |
| **<u>Transverse racking</u>** | |
| **Internal load:**<br>None. | The test procedures shall be as set forth under **4 TRANSVERSE RACKING** |
| **Externally applied forces:**<br>Such as to rack the end structures of the container sideways. The forces shall be equal to those for which the container was designed." | |

**ANNEX III**
**CONTROL AND VERIFICATION**

22 The existing section 4 is replaced by the following:

"**4 Structurally sensitive components**

4.1 The following components are structurally sensitive and should be examined for deficiencies in accordance with the following table:

<table>
<tr><th>(i)</th><th>(ii)</th><th>(iii)</th><th>(iv)</th><th>(v)</th><th>(vi)</th><th>(vii)</th></tr>
<tr><th rowspan="3">Structurally sensitive component</th><th rowspan="3">Serious deficiency requiring immediate out of service determination</th><th rowspan="3">Deficiency requiring advice to owner and restrictions for transport</th><th colspan="4">Restrictions to be applied in case of deficiencies according to column (iii)</th></tr>
<tr><th colspan="2">Empty container</th><th colspan="2">Loaded container</th></tr>
<tr><th>Sea transport</th><th>Other modes</th><th>Sea transport</th><th>Other modes</th></tr>
<tr><td rowspan="2">Top rail</td><td>Local deformation to the rail in excess of 60 mm or separation or cracks or tears in the rail material in excess of 45 mm in length.<br>(see Note 1)</td><td>Local deformation to the rail in excess of 40 mm or separation or cracks or tears in the rail material in excess of 10 mm in length.<br>(see Note 1)</td><td>No restriction</td><td>No restriction</td><td>Bottom lifting not allowed, Top lifting allowed only by use of spreaders without chains</td><td>Bottom lifting not allowed, Top lifting allowed only by use of spreaders without chains</td></tr>
<tr><td colspan="6">Note 1<br>On some designs of tank containers the top rail is not a structurally significant component.</td></tr>
<tr><td rowspan="2">Bottom rail</td><td>Local deformation perpendicular to the rail in excess of 100 mm or separation cracks or tears in the rail's material in excess of 75 mm in length<br>(see Note 2)</td><td>Local deformation perpendicular to the rail in excess of 60 mm or separation cracks or tears in the rail's material: in excess of 25 mm in length in the upper flange; or<br>b) of web in any length(see Note 2)</td><td>No restriction</td><td>No restriction</td><td>Lifting at (any) corner fitting not allowed</td><td>Lifting at (any) corner fitting not allowed</td></tr>
<tr><td colspan="6">Note 2<br>The rails material does not include the rail's bottom flange.</td></tr>
</table>

| (i) | (ii) | (iii) | (iv) | (v) | (vi) | (vii) |
|---|---|---|---|---|---|---|
| **Header** | Local deformation to the header in excess of 80 mm or cracks or tears in excess of 80 mm in length | Local deformation to the header in excess of 50 mm or cracks or tears in excess of 10 mm in length | Container shall not be overstowed | No restriction | Container shall not be overstowed | No restriction |
| **Sill** | Local deformation to the sill in excess of 100 mm or cracks or tears in excess of 100 mm in length. | Local deformation to the sill in excess of 60 mm or cracks or tears in excess of 10 mm in length | Container shall not be overstowed | No restrictions | Container shall not be overstowed | No restrictions |
| **Corner posts** | Local deformation to the post in excess of 50 mm or cracks or tears in excess of 50 mm in length | Local deformation to the post in excess of 30 mm or cracks or tears of any length | Container shall not be overstowed | No restrictions | Container shall not be overstowed | No restrictions |
| **Corner and intermediate fittings** | Missing corner fittings, any through cracks or tears in the fitting, any deformation of the fitting that precludes full engagement of the securing or lifting fittings (see Note 3) or any weld separation of adjoining components in excess of 50 mm | Weld separation of adjoining components of 50 mm or less | Container shall not be lifted on board a ship if the damaged fittings prevent safe lifting or securing. | Container shall be lifted and handled with special care | Container shall not be loaded on board a ship. | Container shall be lifted and handled with special care |
| | | Any reduction in the thickness of the plate containing the top aperture that makes it less than 25 mm thick | Container shall be lifted and handled with special care Container shall not be overstowed when twistlocks have to be used | Container shall be lifted and handled with special care | Container shall not be lifted by the top corner fittings. | Container shall be lifted and handled with special care. |
| | | Any reduction in the thickness of | Container shall not be overstowed | Container shall be lifted and handled | Container shall not be used with fully | Container shall be lifted and handled |

| (i) | (ii) | (iii) | (iv) | (v) | (vi) | (vii) |
|---|---|---|---|---|---|---|
| | in length | the plate containing the top aperture that makes it less than 26 mm thick | when fully automatic twistlocks are to be used | with special care | automatic twistlocks. | with special care. |
| | Note 3<br>The full engagement of securing or lifting fittings is precluded if there is any deformation of the fitting beyond 5 mm from its original plane, any aperture width greater than 66 mm, any aperture length greater than 127 mm or any reduction in thickness of the plate containing the top aperture that makes it less than 23 mm thick. | | | | | |
| **Understructure** | Two or more adjacent cross members missing or detached from the bottom rails.<br>20% or more of the total number of cross members missing or detached.<br>(see Note 4) | One or two cross members missing or detached<br>(see Note 4) | No restrictions | No restrictions | No restrictions | No restrictions |
| | | More than two cross members missing or detached<br>(see Notes 4 & 5 | No restrictions | No restrictions | Maximum payload shall be restricted to 0.5 x P | Maximum payload shall be restricted to 0.5 x P |
| | Note 4<br>If onward transport is permitted, it is essential that detached cross members are precluded from falling free.<br>Note 5<br>Careful cargo discharge is required as forklift capability of the understructure might be limited. | | | | | |

| (i) | (ii) | (iii) | (iv) | (v) | (vi) | (vii) |
|---|---|---|---|---|---|---|
| **Locking rods** | One or more inner locking rods are non-functional (see Note 6) | One or more outer locking rods are non-functional (see Note 6) | Container shall not be overstowed | No restriction | Container shall not be overstowed. Cargo shall be secured against the container frame and the door shall not be used to absorb acceleration forces – otherwise maximum payload shall be restricted to 0.5 P | Cargo shall be secured against the container frame and the door shall not be used to absorb acceleration forces – otherwise maximum payload shall be restricted to 0.5 P |
| | Note 6<br>Some containers are designed and approved (and so recorded on the CSC Plate) to operate with one door open or removed. | | | | | |

"

23 After the existing annex III, a new annex IV is added as follows:

"**ANNEX IV**
**DEFINITIONS**

Notwithstanding definitions in paragraphs 14 to 16 of article II, the following definitions shall be applied for the purpose of the present Convention:

1 *Maximum operating gross mass* or *Rating* or *R* means the maximum allowable sum of the mass of the container and its cargo. The letter R is expressed in units of mass. Where the annexes are based on gravitational forces derived from this value, that force, which is an inertial force, is indicated as *Rg*.

2 *Tare* means the mass of the empty container, including permanently affixed ancillary equipment.

3 *Maximum permissible payload or P* means the difference between maximum operating gross mass or rating and tare. The letter *P* is expressed in units of mass. Where the annexes are based on the gravitational forces derived from this value, that force, which is an inertial force, is indicated as *Pg*.

4 The word *load*, when used to describe a physical quantity to which units may be ascribed, signifies mass.

5 The letter *g* means the standard acceleration of gravity; *g* equals 9.8 $m/s^2$."

***

# ANNEX 33

## THEMATIC PRIORITIES FOR THE ITCP COVERING THE 2014-2015 BIENNIUM

1 Fostering the effective implementation of conventions and other mandatory instruments, with emphasis on the SAR and STCW Conventions, in particular, providing assistance and training to developing countries to comply with the Manila amendments to the STCW Convention, and the ISM and Casualty Investigation Codes, addressing the special needs of Least Developed Countries (LDCs) and Small Island Developing States (SIDS) and particular maritime needs of Africa.

2 Promoting SOLAS chapter XI-2 and the ISPS Code, the continued establishment and strengthening of effective ship and port facility security measures, including support to LRIT implementation, the enhancement of safety and security of the ship/port interface, in accordance with the relevant IMO standards and recommendations and promoting and enhancing maritime security aspects relating to piracy and armed robbery against ships, including facilitation and effective implementation of the Code of Practice for the Investigation of Crimes of Piracy and Armed Robbery against Ships.

3 Supporting maritime administrations to strengthen their human resource capabilities in the discharge of their responsibilities as flag and port States, and promoting the global harmonization and coordination of port State control MoUs.

4 Supporting maritime administrations to strengthen their services dedicated to safety of navigation focusing on Electronic Chart Display Information System (ECDIS) and monitoring of maritime traffic.

5 Capacity-building for effective participation in the Voluntary IMO Member State Audit Scheme and compliance with the IMO Instruments Implementation Code (III Code).

6 Supporting maritime administrations through capacity-building to strengthen their capabilities to deal with the provisions of the IMDG and IMSBC Codes.

7 Promoting the acceptance and implementation of IMO instruments with particular emphasis on the 1993 Torremolinos Protocol and the 1995 STCW-F Convention as well as proactive safety measures relating to fishing vessels and their personnel.

8 Promoting and enhancing maritime safety aspects relating to non-convention ships, including small fishing vessels, with emphasis on the Implementation Guidelines on safety of small fishing vessels and domestic passenger ferries.

9 Supporting maritime training institutions and fellowship programmes.

***

# ANNEX 34

## DRAFT MSC-MEPC CIRCULAR

## REVISED GUIDELINES FOR FORMAL SAFETY ASSESSMENT (FSA) FOR USE IN THE IMO RULE-MAKING PROCESS

1 The Maritime Safety Committee, at its seventy-fourth session (30 May to 8 June 2001), and the Marine Environment Protection Committee, at its forty-seventh session (4 to 8 March 2002), approved:

.1 *Guidelines for Formal Safety Assessment (FSA) for use in the IMO rule-making process* (MSC/Circ.1023-MEPC/Circ.392); and

.2 *Guidance on the use of Human Element Analysing Process (HEAP) and Formal Safety Assessment (FSA) in the IMO rule-making process* (MSC/Circ.1022-MEPC/Circ.391).

2 The Maritime Safety Committee, at its ninety-first session (26 to 30 November 2012), and the Marine Environment Protection Committee, at its [sixty-fifth session (13 to 17 May 2013)], reviewed the aforementioned Guidelines and Guidance in the light of the experience gained with their application and approved the *Revised guidelines for Formal Safety Assessment (FSA) for use in the IMO rule-making process*, as set out in the annex.

3 Member Governments and non-governmental organizations are invited to apply the Revised guidelines contained in this circular.

4 The previous Guidelines contained in MSC/Circ.1023-MEPC/Circ.392, as amended by MSC/Circ.1180-MEPC/Circ.474 and MSC-MEPC.2/Circ.5, and the Guidance contained in MSC/Circ.1022-MEPC/Circ.391, as amended by MSC-MEPC.2/Circ.6, are superseded.

ANNEX

**REVISED GUIDELINES FOR FORMAL SAFETY ASSESSMENT (FSA)
FOR USE IN THE IMO RULE-MAKING PROCESS**

**Table of Contents**

List of figures



List of appendices

# 1 INTRODUCTION

## 1.1 Purpose of FSA

1.1.1 Formal Safety Assessment (FSA) is a structured and systematic methodology, aimed at enhancing maritime safety, including protection of life, health, the marine environment and property, by using risk analysis and cost-benefit assessment.

1.1.2 FSA can be used as a tool to help in the evaluation of new regulations for maritime safety and protection of the marine environment or in making a comparison between existing and possibly improved regulations, with a view to achieving a balance between the various technical and operational issues, including the human element, and between maritime safety or protection of the marine environment and costs.

1.1.3 FSA is consistent with the current IMO decision-making process and provides a basis for making decisions in accordance with resolutions A.500(XII) on *Objectives of the Organization in the 1980s*, A.777(18) on *Work methods and organization of work in committees and their subsidiary bodies* and A.900(21) on *Objectives of the Organization in the 2000s*.

1.1.4 The decision makers at IMO, through FSA, will be able to appreciate the effect of proposed regulatory changes in terms of benefits (e.g. expected reduction of lives lost or of pollution) and related costs incurred for the industry as a whole and for individual parties affected by the decision. FSA should facilitate the development of regulatory changes equitable to the various parties thus aiding the achievement of consensus.

## 1.2 Scope of the Guidelines

These Guidelines are intended to outline the FSA methodology as a tool, which may be used in the IMO rule-making process. In order that FSA can be consistently applied by different parties, it is important that the process is clearly documented and formally recorded in a uniform and systematic manner. This will ensure that the FSA process is transparent and can be understood by all parties irrespective of their experience in the application of risk analysis and cost-benefit assessment and related techniques.

## 1.3 Application

1.3.1 The FSA methodology can be applied by:

.1 a Member Government or an organization in consultative status with IMO, when proposing amendments to maritime safety, pollution prevention and response-related IMO instruments in order to analyse the implications of such proposals; or

.2 a Committee, or an instructed subsidiary body, to provide a balanced view of a framework of regulations, so as to identify priorities and areas of concern and to analyse the benefits and implications of proposed changes.

1.3.2 It is not intended that FSA should be applied in all circumstances, but its application would be particularly relevant to proposals which may have far-reaching implications in terms of either costs (to society or the maritime industry), or the legislative and administrative burdens which may result. FSA may also be useful in those situations where there is a need for risk reduction but the required decisions regarding what to do are unclear, regardless of the scope of the project. In these circumstances, FSA will enable the benefits of proposed changes to be properly established, so as to give Member Governments a clearer perception of the scope of the proposals and an improved basis on which they take decisions.

## 2 BASIC TERMINOLOGY

The following definitions apply in the context of these Guidelines:

**Accident**: An unintended event involving fatality, injury, ship loss or damage, other property loss or damage, or environmental damage.

**Accident category**: A designation of accidents reported in statistical tables according to their nature, e.g. fire, collision, grounding, etc.

**Accident scenario**: A sequence of events from the initiating event to one of the final stages.

**Consequence**: The outcome of an accident.

**Frequency**: The number of occurrences per unit time (e.g. per year).

**Generic model**: A set of functions common to all ships or areas under consideration.

**Hazard**: A potential to threaten human life, health, property or the environment.

**Initiating event**: The first of a sequence of events leading to a hazardous situation or accident.

**Probability** (Objective/frequentistic):
The relative frequency that an event will occur, as expressed by the ratio of the number of occurrences to the total number of possible occurrences.

**Probability** (Subjective/Bayesian):
The degree of confidence in the occurrence of an event, measured on a scale from zero to one. An event with a probability of zero means that it is believed to be impossible; an event with the probability of 1 means that it is believed it will certainly occur."

**Risk**: The combination of the frequency and the severity of the consequence.

**Risk contribution tree (RCT)**: The combination of all fault trees and event trees that constitute the risk model.

**Risk control measure (RCM)**: A means of controlling a single element of risk.

**Risk control option (RCO)**: A combination of risk control measures.

**Risk evaluation criteria**: Criteria used to evaluate the acceptability/tolerability of risk.

## 3 METHODOLOGY

### 3.1 Process

#### 3.1.1 *Steps*

3.1.1.1 FSA should comprise the following steps:

.1 identification of hazards;

.2 risk analysis;

.3 risk control options;

.4 cost-benefit assessment; and

.5 recommendations for decision-making.

3.1.1.2 Figure 1 is a flow chart of the FSA methodology. The process begins with the decision makers defining the problem to be assessed along with any relevant boundary conditions or constraints. These are presented to the group who will carry out the FSA and provide results to the decision makers for use in their resolutions. In cases where decision makers require additional work to be conducted, they would revise the problem statement or boundary conditions or constraints, and resubmit this to the group and repeat the process as necessary. Within the FSA methodology, step 5 interacts with each of the other steps in arriving at decision-making recommendations. The group carrying out the FSA process should comprise suitably qualified and experienced people to reflect the range of influences and the nature of the "event" being addressed.

#### 3.1.2 *Screening approach*

3.1.2.1 The depth or extent of application of the methodology should be commensurate with the nature and significance of the problem; however, experience indicates that very broad FSA studies can be harder to manage. To enable the FSA to focus on those areas that deserve more detailed analysis, a preliminary coarse qualitative analysis is suggested for the relevant ship type or hazard category, in order to include all aspects of the problem under consideration. Whenever there are uncertainties, e.g. in respect of data or expert judgement, the significance of these uncertainties should be assessed.

3.1.2.2 Characterization of hazards and risks should be both qualitative and quantitative, and both descriptive and mathematical, consistent with the available data, and should be broad enough to include a comprehensive range of options to reduce risks.

3.1.2.3 A hierarchical screening approach may be utilized. This would ensure that excessive analysis is not performed by utilizing relatively simple tools to perform initial analyses, the results of which can be used to either support decision-making (if the degree of support is adequate) or to scope/frame more detailed analyses (if not). The initial analyses would therefore be primarily qualitative in nature, with a recognition that increasing degrees of detail and quantification will come in subsequent analyses as necessary.

3.1.2.4 A review of historical data may also be useful as a preparation for a detailed study. For this purpose a loss matrix may be useful. An example can be found in figure 2.

### 3.2 Information and data

3.2.1 The availability of suitable data necessary for each step of the FSA process is very important. When data are not available, expert judgment, physical models, simulations and analytical models may be used to achieve valuable results. Consideration should be given to those data which are already available at IMO (e.g. casualty and deficiency statistics) and to potential improvements in those data in anticipation of an FSA implementation (e.g. a better specification for recording relevant data including the primary causes, underlying factors and latent factors associated with a casualty).

3.2.2 Data concerning incident reports, near misses and operational failures may be very important for the purpose of making more balanced, proactive and cost-effective legislation, as required in paragraph 4.2 of appendix 8. Such data must be reviewed objectively and their reliability, uncertainty and validity assessed and reported. The assumptions and limitations of these data must also be reported.

3.2.3 However, one of the most beneficial qualities of FSA is the proactive nature. The proactive approach is reached through the probabilistic modelling of failures and development of accident scenarios. Analytical modelling has to be used to evaluate rare events where there is inadequate historical data. A rare event is decomposed into more frequent events for which there is more experience available (e.g. evaluate system failure based on component failure data).

3.2.4 Equally, consideration should also be given to cases where the introduction of recent changes may have affected the validity of historic data for assessing current risk.

### 3.3 Expert judgment

3.3.1 The use of expert judgment is considered to be an important element within the FSA methodology. It not only contributes to the proactive nature of the methodology, but is also essential in cases where there is a lack of historical data. Further historical data may be evaluated by the use of expert judgment by which the quality of the historical data may be improved.

3.3.2 In applying expert judgment, different experts may be involved in a particular FSA study. It is unlikely that the experts' opinions will always be in agreement. It might even be the case that the experts have strong disagreements on specific issues. Preferably, a good level of agreement should be reached. It is highly recommended to report the level of agreement between the experts in the results of an FSA study. It is important to know the level of agreement, and this may be established by the use of a concordance matrix or by any other methodology. For example, appendix 9 describes the use of a concordance matrix.

### 3.4 Incorporation of the human element

3.4.1 The human element is one of the most important contributory aspects to the causation and avoidance of accidents. Human element issues throughout the integrated system shown in figure 3 should be systematically treated within the FSA framework, associating them directly with the occurrence of accidents, underlying causes or influences. Appropriate techniques for incorporating human factors should be used.

3.4.2 The human element can be incorporated into the FSA process by using human reliability analysis (HRA). Guidance for the use of HRA within FSA is given in appendix 1 and diagrammatically in figure 4. To allow easy referencing the numbering system in appendix 1 is consistent with that of the rest of the FSA Guidelines.

### 3.5 Evaluating regulatory influence

It is important to identify the network of influences linking the regulatory regime to the occurrence of the event. Construction of Influence Diagrams may assist (see appendix 3).

## 4 PROBLEM DEFINITION

### 4.1 Preparation for the study

The purpose of problem definition is to carefully define the problem under analysis in relation to the regulations under review or to be developed. The definition of the problem should be consistent with operational experience and current requirements by taking into account all relevant aspects. Those which may be considered relevant when addressing ships (not necessarily in order of importance) are:

.1 ship category (e.g. type, length or gross tonnage range, new or existing, type of cargo);

.2 ship systems or functions (e.g. layout, subdivision, type of propulsion);

.3 ship operation (e.g. operations in port and/or during navigation);

.4 external influences on the ship (e.g. Vessel Traffic System, weather forecasts, reporting, routeing);

.5 accident category (e.g. collision, explosion, fire); and

.6 risks associated with consequences such as injuries and/or fatalities to passengers and crew, environmental impact, damage to the ship or port facilities, or commercial impact.

### 4.2 Generic model

4.2.1 In general, the problem under consideration should be characterized by a number of functions. Where the problem relates for instance to a type of ship, these functions include carriage of payload, communication, emergency response, manoeuvrability, etc. Alternatively, where the problem relates to a type of hazard, for instance fire, the functions include prevention, detection, alarm, containment, escape, suppression, etc.

4.2.2 For application of FSA, a generic model should therefore be defined to describe the functions, features, characteristics and attributes which are common to all ships or areas relevant to the problem in question.

4.2.3 The generic model should not be viewed as an individual ship in isolation, but rather as a collection of systems, including organizational, management, operational, human, electronic and hardware aspects which fulfil the defined functions. The functions and systems should be broken down to an appropriate level of detail. Aspects of the interaction of functions and systems and the extent of their variability should be addressed.

4.2.4 A comprehensive view, such as the one shown in figure 3, should be taken, recognizing that the ship's technical and engineering system, which is governed by physical laws, is in the centre of an integrated system. The technical and engineering system is integrally related to the passengers and crew which are a function of human behaviour. The passengers and crew interact with the organizational and management infrastructure and those personnel involved in ship and fleet operations, maintenance and management. These systems are related to the outer environmental context, which is governed by pressures and influences of all parties interested in shipping and the public. Each of these systems is dynamically affected by the others.

### 4.3 Results

The output of the problem definition comprises:

.1 problem definition and setting of boundaries; and

.2 development of a generic model.

## 5 FSA STEP 1 – IDENTIFICATION OF HAZARDS

### 5.1 Scope

The purpose of step 1 is to identify a list of hazards and associated scenarios prioritized by risk level specific to the problem under review. This purpose is achieved by the use of standard techniques to identify hazards which can contribute to accidents, and by screening these hazards using a combination of available data and judgement. The hazard identification exercise should be undertaken in the context of the functions and systems generic to the ship type or problem being considered, which were established in paragraph 4.2 by reviewing the generic model.

### Methods

#### 5.2.1 *Identification of possible hazards*

5.2.1.1 The approach used for hazard identification generally comprises a combination of both creative and analytical techniques, the aim being to identify all relevant hazards. The creative element is to ensure that the process is proactive and not confined only to hazards that have materialized in the past. It typically consists of structured group reviews aiming at identifying the causes and effects of accidents and relevant hazards. Consideration of functional failure may assist in this process. The group carrying out such structured reviews should include experts in the various appropriate aspects, such as ship design, operations and management and specialists to assist in the hazard identification process and incorporation of the human element. A structured group review session may last over a number of days. The analytical element ensures that previous experience is properly taken into account, and typically makes use of background information (for example applicable regulations and codes, available statistical data on accident categories and lists of hazards to personnel, hazardous substances, ignition sources, etc.). Examples of hazards relevant to shipboard operations are shown in appendix 2.

A coarse analysis of possible causes and initiating events and outcome of each accident scenario should be carried out. The analysis may be conducted by using established techniques (examples are described in appendix 3), to be chosen according to the problem in question, whenever possible and in line with the scope of the FSA.

#### 5.2.2 *Ranking*

The identified hazards and their associated scenarios relevant to the problem under consideration should be ranked to prioritize them and to discard scenarios judged to be of minor significance. The frequency and consequence of the scenario outcome requires assessment. Ranking is undertaken using available data, supported by judgement, on the scenarios. A generic risk matrix is shown in figure 5. The frequency and consequence categories used in the risk matrix have to be clearly defined. The combination of a frequency and a consequence category represents a risk level. Appendix 4 provides an example of one way of defining frequency and consequence categories, as well as possible ways of establishing risk levels for ranking purposes.

### 5.3 Results

The output from step 1 comprises:

.1 a list of hazards and their associated scenarios (including initiating events); and

.2 an assessment of accident scenarios (prioritized by risk level).

## 6 FSA STEP 2 – RISK ANALYSIS

### 6.1 Scope

6.1.1 The purpose of the risk analysis in step 2 is a detailed investigation of the causes and initiating events and consequences of the more important accident scenarios identified in step 1. This can be achieved by the use of suitable techniques that model the risk. This allows attention to be focused upon high-risk areas and to identify and evaluate the factors which influence the level of risk.

6.1.2 Different types of risk (i.e. risks to people, the environment or property) should be addressed as appropriate to the problem under consideration. Measures of risk are discussed in appendix 5.

### 6.2 Methods

6.2.1 There are several methods/tools that can be used to perform a risk analysis. The scope of the FSA, types of hazards identified in step 1, and the level of failure data available will all influence which method/tool works best for each specific application. Examples of the different types of risk analysis methods/tools are outlined in appendix 3.

6.2.2 Quantification makes use of accident and failure data and other sources of information as appropriate to the level of analysis. Where data is unavailable, calculation, simulation or the use of established techniques for expert judgement may be used.

6.2.3 Sensitivity analysis and uncertainty analysis should be considered in the quantified and/or qualified risk and risk models and the results should be reported together with the quantitative data and explanation of models used. Methodologies of sensitivity analysis and uncertainty analysis would depend on the method of risk analysis and/or risk models used.

### 6.3 Results

The output from step 2 comprises:

.1 the identification of the high-risk areas which need to be addressed; and

.2 the explanation of risk models.

## 7 FSA STEP 3 – RISK CONTROL OPTIONS

### 7.1 Scope

7.1.1 The purpose of step 3 is to first identify Risk Control Measures (RCMs) and then to group them into a limited number of Risk Control Options (RCOs) for use as practical regulatory options. Step 3 comprises the following four stages:

.1 focusing on risk areas needing control;

.2 identifying potential RCMs;

.3 evaluating the effectiveness of the RCMs in reducing risk by re-evaluating step 2; and

.4 grouping RCMs into practical regulatory options.

7.1.2 Step 3 aims at creating risk control options that address both existing risks and risks introduced by new technology or new methods of operation and management. Both historical risks and newly identified risks (from steps 1 and 2) should be considered, producing a wide range of risk control measures. Techniques designed to address both specific risks and underlying causes should be used.

## 7.2 Methods

### 7.2.1 *Determination of areas needing control*

The purpose of focusing risks is to screen the output of step 2 so that the effort is focused on the areas most needing risk control. The main aspects to making this assessment are to review:

.1 risk levels, by considering frequency of occurrence together with the severity of outcomes. Accidents with an unacceptable risk level become the primary focus;

.2 probability, by identifying the areas of the risk model that have the highest probability of occurrence. These should be addressed irrespective of the severity of the outcome;

.3 severity, by identifying the areas of the risk model that contribute to highest severity outcomes. These should be addressed irrespective of their probability; and

.4 confidence, by identifying areas where the risk model has considerable uncertainty either in risk, severity or probability. These uncertain areas should be addressed.

### 7.2.2 *Identification of potential RCMs*

7.2.2.1 Structured review techniques are typically used to identify new RCMs for risks that are not sufficiently controlled by existing measures. These techniques may encourage the development of appropriate measures and include risk attributes and causal chains. Risk attributes relate to how a measure might control a risk, and causal chains relate to where, in the "initiating event to fatality" sequence, risk control can be introduced.

7.2.2.2 RCMs (and subsequently RCOs) have a range of attributes. These attributes may be categorized according to the examples given in appendix 6.

7.2.2.3 The prime purpose of assigning attributes is to facilitate a structured thought process to understand how an RCM works, how it is applied and how it would operate. Attributes can also be considered to provide guidance on the different types of risk control that could be applied. Many risks will be the result of complex chains of events and a diversity of causes. For such risks the identification of RCMs can be assisted by developing causal chains which might be expressed as follows:

causal factors → failure → circumstance → accident → consequences

7.2.2.4 RCMs should in general be aimed at one or more of the following:

.1 reducing the frequency of failures through better design, procedures, organizational polices, training, etc.;

.2 mitigating the effect of failures, in order to prevent accidents;

.3 alleviating the circumstances in which failures may occur; and

.4 mitigating the consequences of accidents.

7.2.2.5 RCMs should be evaluated regarding their risk reduction effectiveness by using step 2 methodology, including consideration of any potential side effects of the introduction of the RCM.

### 7.2.3 *Composition of RCOs*

7.2.3.1 The purpose of this stage is to group the RCMs into a limited number of well thought out Risk Control Options (RCOs). There is a range of possible approaches to grouping individual measures into options. The following two approaches, related to likelihood and escalation, can be considered:

.1 "general approach" which provides risk control by controlling the likelihood of initiation of accidents and may be effective in preventing several different accident sequences; and

.2 "distributed approach" which provides control of escalation of accidents, together with the possibility of influencing the later stages of escalation of other, perhaps unrelated, accidents.

7.2.3.2 In generating the RCOs, the interested entities, who may be affected by the combinations of measures proposed, should be identified.

7.2.3.3 Some RCMs/RCOs may introduce new or additional hazards, in which case steps 1, 2 and 3 should be reviewed and revised as appropriate.

7.2.3.4 Before adopting a combination of RCOs for which a quantitative assessment of the combined effects was not performed, a qualitative evaluation of RCO interdependencies should be performed. Such an evaluation could take the form of a matrix as illustrated in the following table:

**Table: Interdependencies of RCOs**

| **RCO** | **1** | **2** | **3** | **4** |
|---|---|---|---|---|
| **1** | | Strong | No | Weak |
| **2** | Weak | | Weak | No |
| **3** | No | Weak | | No |
| **4** | Weak | No | No | |

The above matrix table lists the RCOs both vertically as horizontally. Reading horizontally, the table indicates in the first row any dependencies between RCO 1 and each of the other proposed RCOs (2 to 4). For example, in this case the table states that if RCO 1 is implemented, RCO 2, being strongly dependent on RCO 1, needs to be re-evaluated before adopting it in conjunction with RCO 1. On the other hand, RCO 3 is not dependent on RCO 1, and therefore its cost-effectiveness is not altered by the adoption of RCO 1. RCO 4 is weakly dependent on RCO 1, so re-evaluation may not be necessary. In principle one dependency table could be given for cost, benefits and risk reduction. The interdependencies in the above matrix may or may not be symmetric.

7.2.3.5 Where more than one RCOs are proposed to be implemented at the same time, the effectiveness of such combination in reducing the risk should be assessed.

7.2.3.6 Sensitivity analysis and uncertainty analysis should be considered in the analysis of effectiveness of RCMs and RCOs, and the results of sensitivity analysis and uncertainty analysis should be reported.

### 7.3 Results

The output from step 3 comprises:

.1 a list of RCOs with their effectiveness in reducing risk, including the method of analysis;

.2 a list of interested entities affected by the identified RCOs;

.3 a table stating the interdependencies between the identified RCOs; and

.4 results of analysis of side effects of RCOs.

## 8 FSA STEP 4 – COST-BENEFIT ASSESSMENT

### 8.1 Scope

8.1.1 The purpose of step 4 is to identify and compare benefits and costs associated with the implementation of each RCO identified and defined in step 3. A cost-benefit assessment may consist of the following stages:

.1 consider the risks assessed in step 2, both in terms of frequency and consequence, in order to define the base case in terms of risk levels of the situation under consideration;

.2 arrange the RCOs, defined in step 3, in a way to facilitate understanding of the costs and benefits resulting from the adoption of an RCO;

.3 estimate the pertinent costs and benefits for all RCOs;

.4 estimate and compare the cost-effectiveness of each option, in terms of the cost per unit risk reduction by dividing the net cost by the risk reduction achieved as a result of implementing the option; and

.5 rank the RCOs from a cost-benefit perspective in order to facilitate the decision-making recommendations in step 5 (e.g. to screen those which are not cost effective or impractical).

8.1.2 Costs should be expressed in terms of life cycle costs and may include initial, operating, training, inspection, certification, decommission, etc. Benefits may include reductions in fatalities, injuries, casualties, environmental damage and clean-up, indemnity of third party liabilities, etc., and an increase in the average life of ships.

### Methods

#### 8.2.1 *Definition of interested entities*

8.2.1.1 The evaluation of the above costs and benefits can be carried out by using various methods and techniques. Such a process should be conducted for the overall situation and then for those interested entities which are the most influenced by the problem in question.

8.2.1.2 In general, an interested entity can be defined as the person, organization, company, coastal State, flag State, etc., who is directly or indirectly affected by an accident or by the cost-effectiveness of the proposed new regulation. Different interested entities with similar interests can be grouped together for the purpose of applying the FSA methodology and identifying decision-making recommendations.

#### 8.2.2 *Calculation indices for cost-effectiveness*

There are several indices which express cost-effectiveness in relation to safety of life such as Gross Cost of Averting a Fatality (Gross CAF) and Net Cost of Averting a Fatality (Net CAF) as described in appendix 7. Other indices based on damage to and effect on property and environment may be used for a cost-benefit assessment relating to such matters. Comparisons of cost-effectiveness for RCOs may be made by calculating such indices.

8.2.3 For evaluation of RCOs focusing on prevention of oil spill from ships, environmental risk evaluation criteria as described in appendix 7 can be used.

8.2.4 Sensitivity analysis and uncertainty analysis should be considered in the cost-benefit analysis and cost-effectiveness, and the results should be reported.

### 8.3 Results

The output from step 4 comprises:

- .1 costs and benefits for each RCO identified in step 3 from an overview perspective;
- .2 costs and benefits for those interested entities which are the most influenced by the problem in question; and
- .3 cost-effectiveness expressed in terms of suitable indices.

## 9 FSA STEP 5 – RECOMMENDATIONS FOR DECISION-MAKING

### 9.1 Scope

9.1.1 The purpose of step 5 is to define recommendations which should be presented to the relevant decision makers in an auditable and traceable manner. The recommendations would be based upon the comparison and ranking of all hazards and their underlying causes; the comparison and ranking of risk control options as a function of associated costs and benefits; and the identification of those risk control options which keep risks as low as reasonably practicable.

9.1.2 The basis on which these comparisons are made should take into account that, in ideal terms, all those entities that are significantly influenced in the area of concern should be equitably affected by the introduction of the proposed new regulation. However, taking into consideration the difficulties of this type of assessment, the approach should be, at least in the earliest stages, as simple and practical as possible.

### Methods

#### 9.2.1 *Scrutiny of results*

Recommendations should be presented in a form that can be understood by all parties irrespective of their experience in the application of risk and cost-benefit assessment and related techniques. Those submitting the results of an FSA process should provide timely and open access to relevant supporting documents and a reasonable opportunity for and a mechanism to incorporate comments.

### 9.2.2 *Risk evaluation criteria*

There are several standards for risk acceptance criteria, none as yet universally accepted. While it is desirable for the Organization and Member Governments which propose new regulations or modifications to existing regulations to determine agreed risk evaluation criteria after wide and deep consideration, those used within an FSA should be explicit.

### 9.3 Results

The output from step 5 comprises:

.1 an objective comparison of alternative options, based on the potential reduction of risks and cost-effectiveness, in areas where legislation or rules should be reviewed or developed;

.2 feedback information to review the results generated in the previous steps; and

.3 recommended RCO(s) accompanied with the application of the RCO(s), e.g. application of ship type(s) and construction date and/or systems to be fitted on board.

## 10 PRESENTATION OF FSA RESULTS

10.1 To facilitate the common understanding and use of FSA at IMO in the rule-making process, each report of an FSA process should:

.1 provide a clear statement of the final recommendations, ranked and justified in an auditable and traceable manner;

.2 list the principal hazards, risks, costs and benefits identified during the assessment;

.3 explain and reference the basis for significant assumptions, limitations, uncertainties, data models, methodologies and inferences used or relied upon in the assessment or recommendations, results of hazard identifications and risk analysis, risk control options and results of cost-benefit analysis to be considered in the decision-making process;

.4 describe the sources, extent and magnitude of significant uncertainties associated with the assessment or recommendations;

.5 describe the composition and expertise of groups that performed each step of the FSA process by providing a short curriculum vitae of each expert and describing the basis of selection of the experts; and

.6 describe the method of decision-making in the group(s) that performed the FSA process (see paragraph 3.3).

10.2 The standard format for reporting the FSA process is shown in appendix 8.

## 11 APPLICATION AND REVIEW PROCESS OF FSA

The Guidance for practical application and review process of FSA is contained in appendix 10.

**FIGURE 1**

**FLOW CHART OF THE FSA METHODOLOGY**

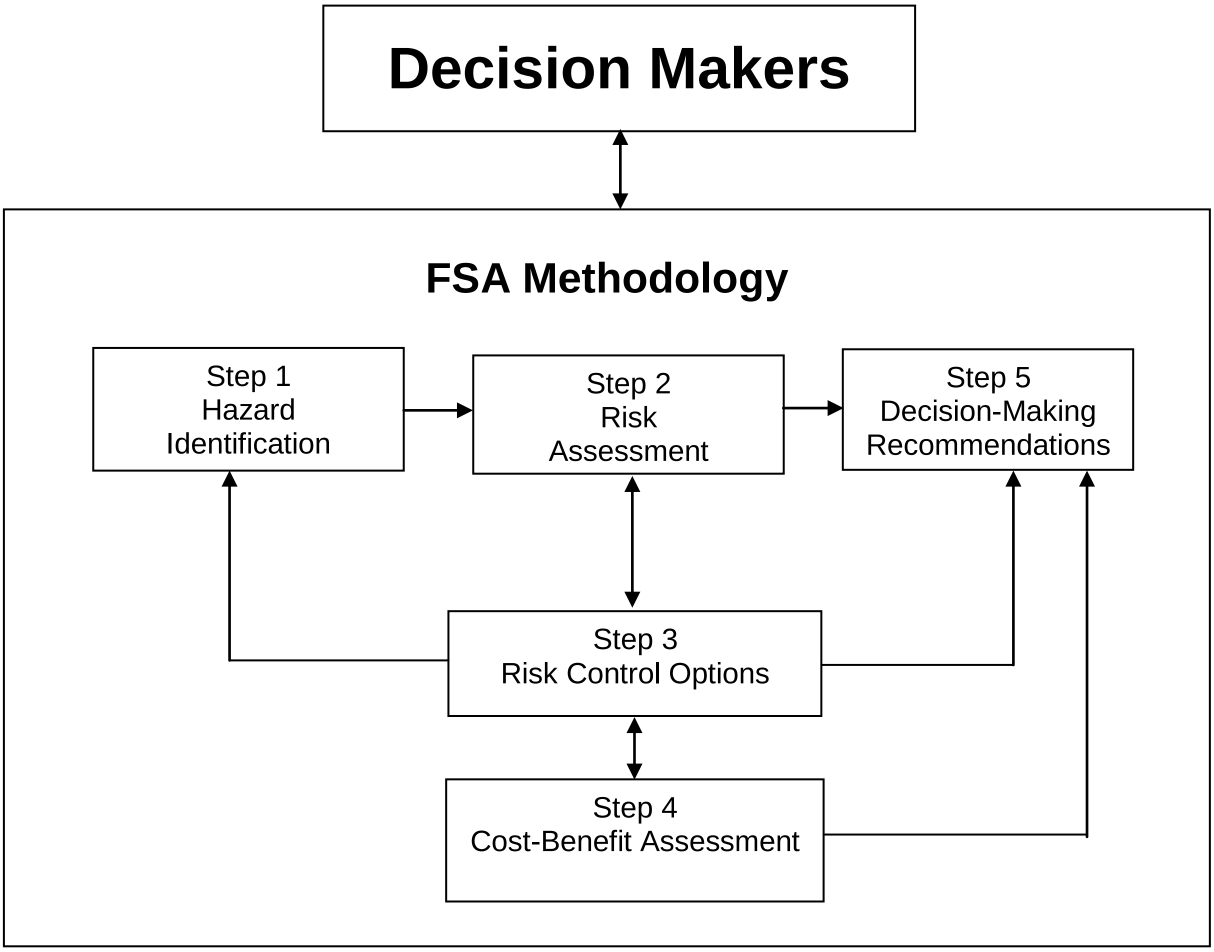


**FIGURE 2**

**EXAMPLE OF LOSS MATRIX**

| **Ship Accident Loss (£ per ship year)** | | | | | |
|---|---|---|---|---|---|
| Accident Type | Ship accident cost | Environmental damage and clean up | Risk to life | Risk of injuries and ill health | Total cost |
| | £ | £/tonne x number of tonnes | Fatalities x £ X m | DALY x £ Y | £ |
| Collision<br>Contact<br>Foundered<br>Fire/explosion<br>Hull damage<br>Machinery damage<br>War loss<br>Grounding<br>Other ship accidents<br>Other oil spills<br>Personal accidents | | | | | |
| TOTAL | | | | | |

DALY = Disabled Adjourned Life Years
(The World Health Report 2000; www.who.int)

**FIGURE 3**

**COMPONENTS OF THE INTEGRATED SYSTEM**

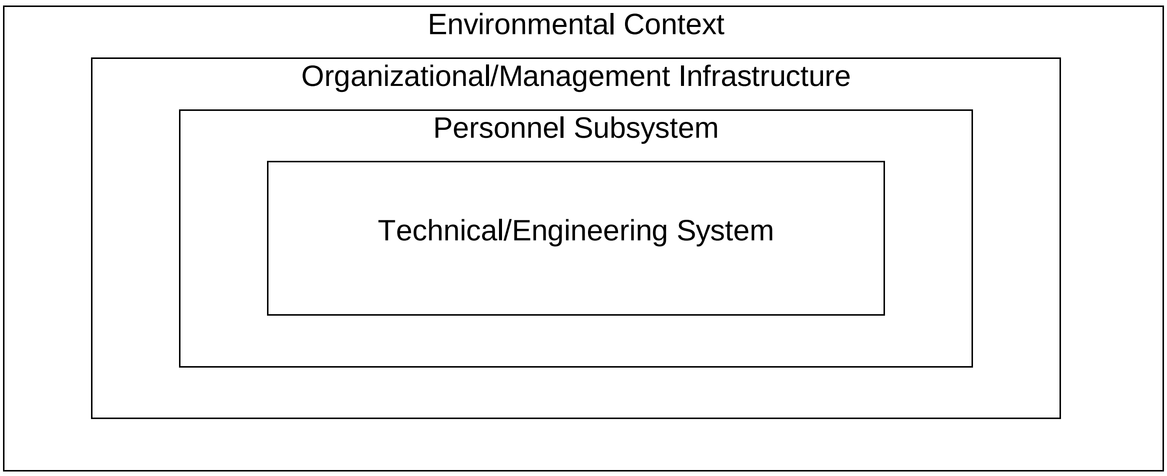


**FIGURE 4**

**INCORPORATION OF HUMAN RELIABILITY ANALYSIS (HRA) INTO THE FSA PROCESS**

| FSA PROCESS | TASKS REQUIRED TO INCORPORATE HRA |
|---|---|
| Step 1<br>Hazard Identification | Human related hazards (appendix 1-5.2)<br>High level task analysis (appendix 1-5.2)<br>Preliminary description of outcome (appendix 1-5.3) |
| Step 2<br>Risk Analysis | Detailed task analysis for critical tasks (appendix 1-6.2)<br>Human error analysis (appendix 1-6.3)<br>Human error quantification (appendix 1-6.4) |
| Step 3<br>Risk Control Options | Risk control options for human element (appendix 1-7.2) |
| Step 4<br>Cost-Benefit Assessment | |
| Step 5<br>Recommendations for Decision-Making | |

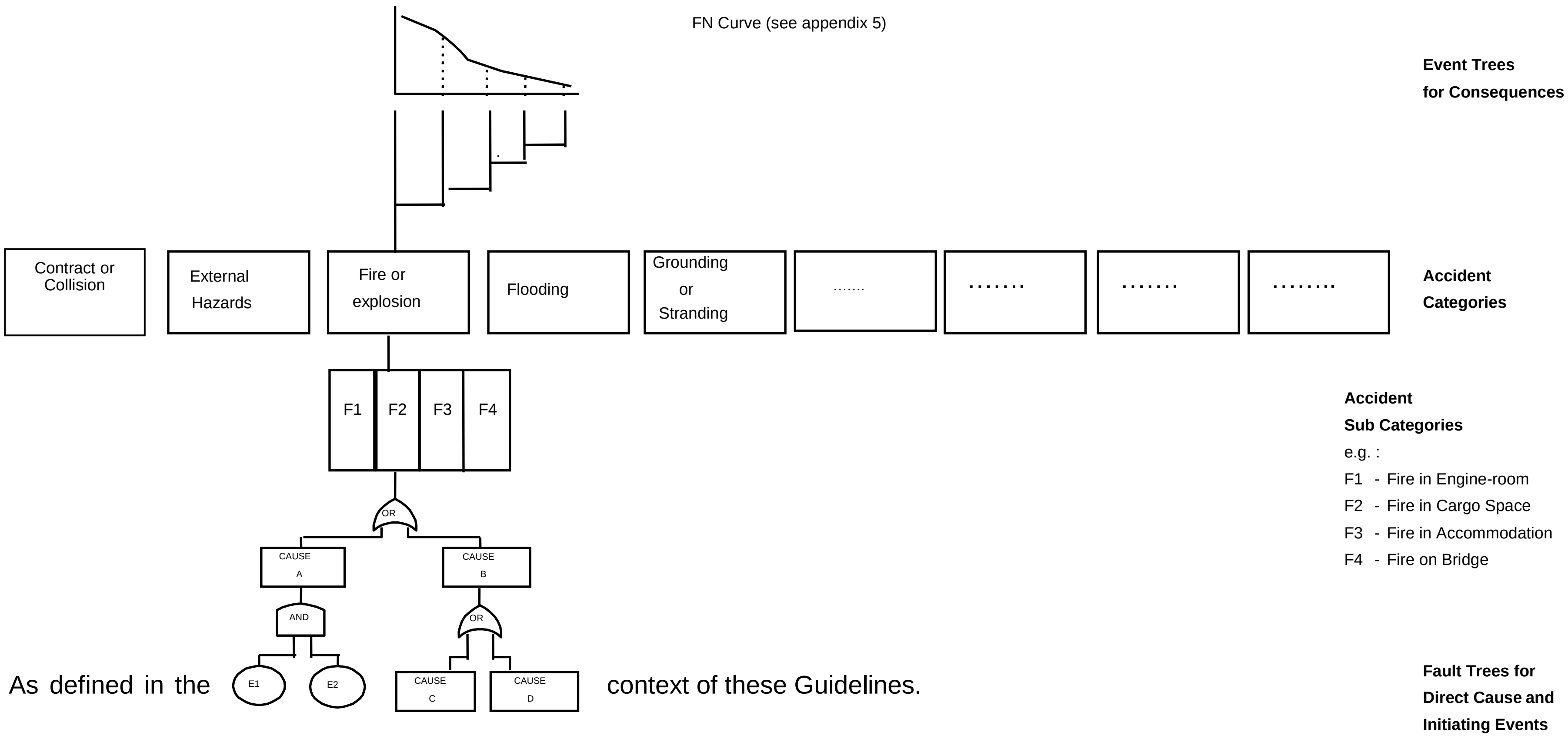
**FIGURE 5**
**RISK MATRIX**

| FREQUENCY | | | | |
|---|---|---|---|---|
| Frequent | | | | HIGH RISK |
| Reasonably probable | | | | |
| Remote | | | | |
| Extremely remote | LOW RISK | | | |
| | Minor | Significant | Severe | Catastrophic |

CONSEQUENCE

## FIGURE 6

## EXAMPLE OF A RISK CONTRIBUTION TREE*




* As defined in the context of these Guidelines.

## Appendix 1

## GUIDANCE ON HUMAN RELIABILITY ANALYSIS (HRA)

### 1 INTRODUCTION

### 1.1 Purpose of Human Reliability Analysis (HRA)

1.1.1 Those industries which routinely use quantitative risk assessment (QRA) to assess the frequency of system failures as part of the design process or ongoing operations management, have recognized that in order to produce valid results it is necessary to assess the contribution of the human element to system failure. The accepted way of incorporating the human element into QRA and FSA studies is through the use of human reliability analysis (HRA).

1.1.2 HRA was developed primarily for the nuclear industry. Using HRA in other industries requires that the techniques be appropriately adapted. For example, because the nuclear industry has many built-in automatic protection systems, consideration of the human element can be legitimately delayed until after consideration of the overall system performance. On board ships, the human has a greater degree of freedom to disrupt system performance. Therefore, a high-level task analysis needs to be considered at the outset of an FSA.

1.1.3 HRA is a process, which comprises a set of activities and the potential use of a number of techniques depending on the overall objective of the analysis. HRA may be performed on a qualitative or quantitative basis depending on the level of FSA being undertaken. If a full quantitative analysis is required then Human Error Probabilities (HEPs) can be derived in order to fit into quantified system models such as fault and event trees. However in many instances a qualitative analysis may be sufficient. The HRA process usually consists of the following stages:

.1 identification of key tasks;

.2 task analysis of key tasks;

.3 human error identification;

.4 human error analysis; and

.5 human reliability quantification.

1.1.4 Where a fully-quantified FSA approach is required, HRA can be used to develop a set of HEPs for incorporation into probabilistic risk assessment. However, this aspect of HRA can be over-emphasized. Experienced practitioners admit that greater benefit is derived from the early, qualitative stages of task analysis and human error identification. Effort expended in these areas pays dividends because an HRA exercise (like an FSA study) is successful only if the correct areas of concern have been chosen for investigation.

1.1.5 It is also necessary to bear in mind that the data available for the last stage of HRA, human reliability quantification, are currently limited. Although several human error databases have been built up, the data contained in them are only marginally relevant to the maritime industry. In some cases where an FSA requires quantitative results from the HRA, expert judgement may be the most appropriate method for deriving suitable data. Where expert judgement is used, it is important that the judgement can be properly justified as required by appendix 8 of the FSA Guidelines.

### 1.2 Scope of the HRA Guidance

1.2.1 Figure 4 of the FSA Guidelines shows how the HRA Guidance fits into the FSA process.

1.2.2 The amount of detail provided in this Guidance is at a level similar to that given in the FSA Guidelines, i.e. it states what should be done and what considerations should be taken into account. Details of some techniques used to carry out the process are provided in the appendices of this Guidance.

1.2.3 The sheer volume of information about this topic prohibits the provision of in-depth information: there are numerous HRA techniques, and task analysis is a framework encompassing dozens of techniques. Table 1 lists the main references which could be pursued.

1.2.4 As with FSA, HRA can be applied to the design, construction, maintenance and operations of a ship.

### 1.3 Application

It is intended that this guidance should be used wherever an FSA is conducted on a system which involves human action or intervention which affects system performance.

## 2 BASIC TERMINOLOGY

**Error producing condition**: Factors that can have a negative effect on human performance.

**Human error**: A departure from acceptable or desirable practice on the part an individual or a group of individuals that can result in unacceptable or undesirable results.

**Human error recovery**: The potential for the error to be recovered, either by the individual or by another person, before the undesired consequences are realized.

**Human error consequence**: The undesired consequences of human error.

**Human error probability**: Defined as follows:

$$HEP = \frac{Number\ of\ human\ errors\ that\ have\ occurred}{Number\ of\ opportunities\ for\ human\ error}$$

**Human reliability**: The probability that a person: (1) correctly performs some system-required activity in a required time period (if time is a limiting factor) and (2) performs no extraneous activity that can degrade the system. *Human unreliability* is the opposite of this definition.

**Performance shaping factors**: Factors that can have a positive or negative effect on human performance.

**Task analysis**: A collection of techniques used to compare the demands of a system with the capabilities of the operator, usually with a view to improving performance, e.g. by reducing errors.

## 3 METHODOLOGY

HRA can be considered to fit into the overall FSA process in the following way:

.1 identification of key human tasks consistent with step 1;

.2 risk assessment, including a detailed task analysis, human error analysis and human reliability quantification consistent with step 2; and

.3 risk control options consistent with step 3.

## 4 PROBLEM DEFINITION

Additional human element issues which may be considered in the problem definition include:

.1 personal factors, e.g. stress, fatigue;

.2 organizational and leadership factors, e.g. manning level;

.3 task features, e.g. task complexity; and

.4 onboard working conditions, e.g. human-machine interface.

## 5 HRA STEP 1 – IDENTIFICATION OF HAZARDS

### 5.1 Scope

5.1.1 The purpose of this step is to identify key potential human interactions which, if not performed correctly, could lead to system failure. This is a broad scoping exercise where the aim is to identify areas of concern (e.g. whole tasks or large sub-tasks) requiring further investigation. The techniques used here are the same as those used in step 2, but in step 2 they are used much more rigorously.

5.1.2 Human hazard identification is the process of systematically identifying the ways in which human error can contribute to accidents during normal and emergency operations. As detailed in paragraph 5.2.2 below, standard techniques such as Hazard and Operability (HazOp) study and Failure Mode and Effects Analysis (FMEA) can be, and are, used for this purpose. Additionally, it is strongly advised that a high-level functional task analysis is carried out. This section discusses those techniques which were developed solely to address human hazards.

### 5.2 Methods for hazard identification

5.2.1 In order to carry out a human hazard analysis, it is first necessary to model the system in order to identify the normal and emergency operating tasks that are carried out by the crew. This is achieved by the use of a high-level task analysis (as described in table 2) which identifies the main human tasks in terms of operational goals. Developing a task analysis can utilize a range of data collection techniques, e.g. interviews, observation, critical incident, many of which can be used to directly identify key tasks. Additionally, there are many other sources of information which may be consulted, including design information, past experience, normal and emergency operating procedures, etc.

5.2.2 At this stage it is not necessary to generate a lot of detail. The aim is to identify those key human interactions which require further attention. Therefore, once the main tasks, sub-tasks and their associated goals have been listed, the potential contributors to human error of each task need to be identified together with the potential hazard arising. There are a number of techniques which may be utilized for this purpose, including human error HazOp, Hazard Checklists, etc. An example of human-related hazards identifying a number of different potential contributors to sub-standard performance is included in table 3.

5.2.3 For each task and sub-task identified, the associated hazards and their associated scenarios should be ranked in order of their criticality in the same manner as discussed in section 5.2.2 of the FSA Guidelines.

**5.3 Results**

The output from step 1 is a set of activities (tasks and sub-tasks) with a ranked list of hazards associated with each activity. This list needs to be coupled with the other lists generated by the FSA process, and should therefore be produced in a common format. Only the top few hazards for critical tasks are subjected to risk assessment, less critical tasks are not examined further.

**6 HRA STEP 2 – RISK ANALYSIS**

**6.1 Scope**

The purpose of step 2 is to identify those areas where the human element poses a high risk to system safety and to evaluate the factors influencing the level of risk.

**6.2 Detailed task analysis**

6.2.1 At this stage, the key tasks are subjected to a detailed task analysis. Where the tasks involve more decision-making than action, it may be more appropriate to carry out a cognitive task analysis. Table 2 outlines the extended task analysis which was developed for analysing decision-making tasks.

6.2.2 The task analysis should be developed until all critical sub-tasks have been identified. The level of detail required is that which is appropriate for the criticality of the operation under investigation. A good general rule is that the amount of detail required should be sufficient to give the same degree of understanding as that provided by the rest of the FSA exercise.

**6.3 Human error analysis**

6.3.1 The purpose of human error analysis is to produce a list of potential human errors that can lead to the undesired consequence that is of concern. To help with this exercise, some examples of typical human errors are included in figure 1.

6.3.2 Once all potential errors have been identified, they are typically classified along the following lines. This classification allows the identification of a critical subset of human errors that must be addressed:

.1 the supposed cause of the human error;

.2 the potential for error-recovery, either by the operator or by another person (this includes consideration of whether a single human error can result in undesired consequences); and

.3 the potential consequences of the error.

6.3.3 Often, a qualitative analysis should be sufficient. A simple qualitative assessment can be made using a recovery/consequence matrix such as that illustrated in figure 2. Where necessary, a more detailed matrix can be developed using a scale for the likely consequences and levels of recovery.

**6.4 Human error quantification**

6.4.1 This activity is undertaken where a probability of human error (HEP) is required for input into a quantitative FSA. Human error quantification can be conducted in a number of ways.

6.4.2 In some cases, because of the difficulties of acquiring reliable human error data for the maritime industry, expert judgement techniques may need to be used for deriving a probability for human error. Expert judgment techniques can be grouped into four categories:

.1 paired comparisons;

.2 ranking and rating procedures;

.3 direct numerical estimation; and

.4 indirect numerical estimation.

It is particularly important that experts are provided with a thorough task definition. A poor definition invariably produces poor estimates.

6.4.3 Absolute Probability Judgement (APJ) is a good direct method. It can be used in various forms, from the single expert assessor to large groups of individuals whose estimates are mathematically aggregated (see table 4). Other techniques which focus on judgements from multiple experts include: brainstorming; consensus decision-making; Delphi; and the Nominal Group technique.

6.4.4 Alternatives to expert opinion are historic data (where available) and generic error probabilities. Two main methods for HRA which have databases of human error probabilities (mainly for the nuclear industry) are the Technique for Human Error Rate Prediction (THERP) and Human Error Assessment and Reduction Technique (HEART) (see table 4).

**6.4.5 *Technique for Human Error Rate Prediction (THERP)***

THERP was developed by Swain and Guttmann (1983) of Sandia National Laboratories for the US Nuclear Regulatory Commission, and has become the most widely used human error quantitative prediction technique. THERP is both a human reliability technique and a human error databank. It models human errors using probability trees and models of dependence, but also considers performance shaping factors (PSFs) affecting action. It is critically dependent on its database of human error probabilities. It is considered to be particularly effective in quantifying errors in highly procedural activities.

**6.4.6 *Human Error Assessment and Reduction Technique (HEART)***

HEART is a technique developed by Williams (1985) that considers particular ergonomics, tasks and environmental factors that adversely affect performance. The extent to which each factor independently affects performance is quantified and the human error probability is calculated as a function of the product of those factors identified for a particular task.

6.4.7 HEART provides specific information on remedial risk control options to combat human error. It focuses on five particular causes and contributions to human error: impaired system knowledge; response time shortage; poor or ambiguous system feedback; significant judgement required of operator; and the level of alertness resulting from duties, ill health or the environment.

6.4.8 When applying human error quantification techniques, it is important to consider the following:

.1 Magnitudes of human error are sufficient for most applications. A 'gross' approximation of the human error magnitude is sufficient. The derivation of HEPs may be influenced by modelling and quantitative uncertainties. A final sensitivity analysis should be presented to show the effect of uncertainties on the estimated risks.

.2 Human error quantification can be very effective when used to produce a comparative analysis rather than an exact quantification. Then human error quantification can be used to support the evaluation of various risk control options.

.3 The detail of quantitative analysis should be consistent with the level of detail of the FSA model. The HRA should not be more detailed than the technical elements of the FSA. The level of detail should be selected based upon the contribution of the activity to the risk, system or operation being analysed.

.4 The human error quantification tool selected should fit the needs of the analysis. There are a significant number of human error quantification techniques available. The selection of a technique should be assessed for consistency, usability, validity of results, usefulness, effective use of resources for the HRA and the maturity of the technique.

### 6.5 Results

6.5.1 The output from this step comprises:

.1 an analysis of key tasks;

.2 an identification of human errors associated with these tasks; and

.3 an assessment of human error probabilities (optional).

6.5.2 These results should then be considered in conjunction with the high-risk areas identified elsewhere in step 2.

## 7 HRA STEP 3 – RISK CONTROL OPTIONS

### 7.1 Scope

The purpose of step 3 is to consider how the human element is considered within the evaluation of technical, human, work environment, personnel and management related risk control options.

## 7.2 Application

7.2.1 The control of risks associated with the human interaction with a system can be approached in the same way as for the development of other risk control measures. Measures can be specified in order to:

.1 reduce the frequency of failure;

.2 mitigate the effects of failure;

.3 alleviate the circumstances in which failures occur; and

.4 mitigate the consequences of accidents.

7.2.2 Proper application of HRA can reveal that technological innovations can also create problems which may be overlooked by FSA evaluation of technical factors only. A typical example of this is the creation of long periods of low workload when a high degree of automation is used. This in turn can lead to an inability to respond correctly when required or even to the introduction of 'risk taking behaviour' in order to make the job more interesting.

7.2.3 When dealing with risk control concerning human activity, it is important to realize that more than one level of risk control measure may be necessary. This is because human involvement spans a wide range of activities from day-to-day operations through to senior management levels. Secondly, it must also be stressed that a basic focus on good system design utilizing ergonomics and human factor principles is needed in order to achieve enhanced operational safety and performance levels.

7.2.4 In line with figure 3 of the FSA Guidelines, risk control measures for human interactions can be categorized into four areas as follows: (1) technical/engineering subsystem, (2) working environment, (3) personnel subsystem and (4) organizational/management subsystem. A description of the issues that may be considered within each of these areas is given in figure 3.

7.2.5 Once the risk control measures have been initially specified, it is important to reassess human intervention in the system in order to assess whether any new hazards have been introduced. For example, if a decision had been taken to automate a particular task, then the new task would need to be re-evaluated.

## 7.3 Results

The output from this step comprises a range of risk control options categorized into 4 areas as presented in figure 3, easing the integration of human related risk into step 3.

## 8 HRA STEP 4 – COST-BENEFIT ASSESSMENT

No specific HRA guidance for this section is required.

## 9 HRA STEP 5 – RECOMMENDATIONS FOR DECISION-MAKING

Judicious use of the results of the HRA study should contribute to a set of balanced decisions and recommendations of the whole FSA study.

**FIGURE 1**

**TYPICAL HUMAN ERRORS**

| ***Physical Errors*** | ***Mental Errors*** |
|---|---|
| Action omitted<br>Action too much/little<br>Action in wrong direction<br>Action mistimed<br>Action on wrong object | Lack of knowledge of system/situation<br>Lack of attention<br>Failure to remember procedures<br>Communication breakdowns<br>Miscalculation |

**FIGURE 2**

**RECOVERY/CONSEQUENCE MATRIX**

| | | | |
|---|---|---|---|
| | High | May need to consider | MUST CONSIDER |
| Consequence | Low | No need to consider | May need to consider |
| | | High | Low |
| | | Recovery | |

## FIGURE 3

## EXAMPLES OF RISK CONTROL OPTIONS

**Technical/engineering sub-system**

- ergonomic design of equipment and work spaces
- good layout of bridge, machinery spaces
- ergonomic design of the man-machine interface/human computer interface
- specification of information requirements for the crew to perform their tasks
- clear labelling and instructions on the operation of ship systems and control/ communications equipment

**Working environment**

- ship stability, effect on crew of working under conditions of pitch/roll
- weather effects, including fog, particularly on watch-keeping or external tasks
- ship location, open sea, approach to port, etc.
- appropriate levels of lighting for operations and maintenance tasks and for day and night time operations
- consideration of noise levels (particularly for effect on communications)
- consideration of the effects of temperature and humidity on task performance
- consideration of the effects of vibration on task performance

**Personnel subsystem**

- development of appropriate training for crew members
- crew levels and make up
- language and cultural issues
- workload assessment (both too much and too little workload can be problematic)
- motivational and leadership issues

**Organizational/management subsystem**

- development of organization policies on recruitment, selection, training, crew levels and make up, competency assessment, etc.
- development of operational and emergency procedures (including provisions for tug and salvage services)
- use of safety management systems
- provision of weather forecasting/routeing services

## TABLE 1

## REFERENCES

1. Advisory Committee on the Safety of Nuclear Installations (1991*) Human Factors Study Group Second Report: Human reliability assessment – a critical overview*.
2. Annett, J. and Stanton, N.A. (1998) Special issue on task analysis. *Ergonomics*, 41(11).
3. Ball, P.W. (1991) The guide to reducing human error in process operations. *Human Factors in Reliability Group, SRDA – R3, HMSO.*
4. Gertman, D.I. and Blackman, H.S. (1994) *Human Reliability and Safety Analysis Data Handbook*. Wiley & Sons: New York.
5. Hollnagel, E. (1998) *Cognitive Reliability and Error Analysis Method*. Elsevier Applied Science: London.
6. Human Factors in Reliability Group (1995) *Improving Compliance with Safety Procedures – Reducing Industrial Violations*. HSE Books: London.
7. Humphreys, P. (ed.) (1995*) Human Reliability Assessor's Guide: A report by the Human Factors in Reliability Group:* Cheshire.
8. Johnson, L. and Johnson, N.E. (1987) A Knowledge Elicitation Method for Expert Systems Design. *Systems Research and Info. Science,* Vol.2, 153-166.
9. Kirwan, B. (1992) Human error identification in human reliability assessment. Part I: Overview of approaches. *Applied Ergonomics*, 23(5), 299-318.
10. Kirwan, B. (1997) A validation of three Human Reliability Quantification techniques – THERP, HEART and JHEDI: Part III - Results and validation exercise. *Applied Ergonomics*, 28(1), 27-39.
11. Kirwan, B. (1994) *A Guide to Practical Human Reliability Assessment*. Taylor & Francis: London.
12. Kirwan, B. and Ainsworth, L.K. (1992) *A Guide to Task Analysis. London*: Taylor & Francis.
13. Kirwan, B., Kennedy, R., Taylor-Adams, S. and Lambert, B. (1997) A validation of three Human Reliability Quantification techniques—THERP, HEART and JHEDI: Part II – Practical aspects of the usage of the techniques. *Applied Ergonomics*, 28(1), 17-25.
14. Lees, F. (1996) Human factors and human element. *Loss Prevention in the Process Industries: Hazard Identification, Assessment and Control.* Vol. 3. Butterworth Heinemann.
15. Pidgeon, N., Turner, B. and Blockley, D. (1991) The use of Grounded Theory for conceptual analysis in knowledge elicitation. *International Journal of Man-Machine Studies,* Vol.35, 151-173*.*
16. Rasmussen, J., Pedersen, O.M., Carino, A., Griffon, M., Mancini, C., and Gagnolet, P. (1981*) Classification system for reporting events involving human malfunctions. Report Riso-M-2240*, DK-4000. Roskilde, Riso National Laboratories, Denmark.
17. Swain, A.D. (1989) *Comparative Evaluation of Methods for Human Reliability Analysis*. Gesellschaft für Reaktorsicherheit (GRS) mbH.
18. Swain, A.D. and Guttmann, H.E. (1983) *Handbook of Human Reliability Analysis with Emphasis on Nuclear Power Plant Applications: Final Report. NUREG/CR* – 1278. U.S. Nuclear Regulatory Commission.
19. Williams, J.C. (1986) *HEART – A proposed method for assessing and reducing human error. Proceedings, 9th Advances in Reliability Technology Symposium, University of Bradford*. NCRS, UKAEA. Culcheth, Cheshire.

## TABLE 2

## SUMMARY OF TASK ANALYSIS TYPES

**1 High-level task analysis**

1.1 High-level task analysis here refers to the type of task analysis which allows an analyst to gain a broad, but shallow, overview of the main functions which need to be performed to accomplish a particular task.

1.2 High-level task analysis is undertaken in the following way:

.1 describe all operations within the system in terms of the tasks required to achieve a specific operational goal; and

.2 consider goals associated with normal operations, emergency procedures, maintenance and recovery measures.

1.3 The analysis is recorded either in a hierarchical format or in tabular form.

**2 Detailed task analysis**

2.1 Detailed task analysis is undertaken to identify:

.1 the overall task (or job) that is done;

.2 sub-tasks;

.3 all of the people who contribute to the task and their interactions;

.4 how the work is done, i.e. the working practices in normal and emergency situations;

.5 any controls, displays, tools, etc., which are used; and

.6 factors which influence performance.

2.2 There are many task analysis techniques – Kirwan and Ainsworth (1992) list more than twenty. They note that the most widely used, hierarchical task analysis (HTA), can be used as a framework for applying other techniques:

.1 data collection techniques, e.g. activity sampling, critical incident, questionnaires;

.2 task description techniques, e.g. charting and network techniques, tabular task analysis;

.3 tasks simulation methods, e.g. computer modelling and simulation;

.4 task behaviour assessment methods, e.g. management and oversight risk trees; and

.5 task requirement evaluation methods, e.g. ergonomics checklists.

## 3 Extended task analysis (XTA)

3.1 Traditional task analysis was designed for investigating manual tasks, and is not so useful for analysing intellectual tasks, e.g. navigation decisions. Extended task analysis or other cognitive task analyses (see Annett and Stanton, 1998) can be used where the focus is less on what actions are performed and more on understanding the rationale for the decisions that are taken.

3.2 XTA is used to map out the logical bases of the decision-making process which underpin the task under examination. The activities which comprise XTA techniques are described in Johnson and Johnson (1987). In summary, they are:

.1 Interview. The interviewer asks about the conditions which enable or disable certain actions to be performed, and how a change in the conditions affects those choices. The interviewer examines the individual's intentions to make sure that all relevant aspects of the situation have been taken into account. This enables the analyst to build up a good understanding of what the individual is doing and why, and how it would change under varying conditions.

.2 Qualitative analysis of data. The interview is tape-recorded, transcribed and subsequently analysed. Methods for analysing qualitative data are well-established in social science and more recently utilized in safety engineering. The technique (called Grounded Theory) is described in detail by Pidgeon, et al*.* (1991).

.3 Representation of the analysis in an appropriate format. The representation scheme used in XTA is called systemic grammar networks – a form of associative network – see Johnson and Johnson (1987).

.4 Validation activities, e.g. observation, hypothesis.

## TABLE 3

## EXAMPLES OF HUMAN-RELATED HAZARDS

1 Human error occurs on board ships when a crew member's ability falls below what is needed to successfully complete a task. Whilst this may be due to a lack of ability, more commonly it is because the existing ability is hampered by adverse conditions. Below are some examples (not complete) of personal factors and unfavourable conditions which constitute hazards to optimum performance. A comprehensive examination of all human-related hazards should be performed. During the "design stage" it is typical to focus mainly on task features and on board working conditions as potential human-related hazards.

**2 Personal factors**

.1 Reduced ability, e.g. reduced vision or hearing;

.2 Lack of motivation, e.g. because of a lack of incentives to perform well;

.3 Lack of ability, e.g. lack of seamanship, unfamiliarity with vessel, lack of fluency of the language used on board;

.4 Fatigue, e.g. because of lack of sleep or rest, irregular meals; and

.5 Stress.

**3 Organizational and leadership factors**

.1 Inadequate vessel management, e.g. inadequate supervision of work, lack of coordination of work, lack of leadership;

.2 Inadequate ship owner management, e.g. inadequate routines and procedures, lack of resources for maintenance, lack of resources for safe operation, inadequate follow-up of vessel organization;

.3 Inadequate manning, e.g. too few crew, untrained crew; and

.4 Inadequate routines, e.g. for navigation, engine-room operations, cargo handling, maintenance, emergency preparedness.

**4 Task features**

.1 Task complexity and task load, i.e. too high to be done comfortably or too low causing boredom;

.2 Unfamiliarity of the task;

.3 Ambiguity of the task goal; and

.4 Different tasks competing for attention.

## 5 Onboard working conditions

.1 Physical stress from, e.g. noise, vibration, sea motion, climate, temperature, toxic substances, extreme environmental loads, night-watch;

.2 Ergonomic conditions, e.g. inadequate tools, inadequate illumination, inadequate or ambiguous information, badly-designed human-machine interface;

.3 Social climate, e.g. inadequate communication, lack of cooperation; and

.4 Environmental conditions, e.g. restricted visibility, high traffic density, restricted fairway.

# TABLE 4

## SUMMARY OF HUMAN ERROR ANALYSIS TECHNIQUES

The two main HRA quantitative techniques (HEART and THERP) are outlined below. CORE-DATA provides data on generic probabilities. As the data from all of these sources are based on non-marine industries, they need to be used with caution. A good alternative is to use expert judgement and one technique for doing this is Absolute Probability Judgement.

### 1 Absolute Probability Judgement (APJ)

1.1 APJ refers to a group of techniques that utilize expert judgement to develop human error probabilities (HEPs) detailed in Kirwan (1994) and Lees (1996). These techniques are used when no relevant data exist for the situation in question, making some form of direct numerical estimation the only way of developing values for HEPs.

1.2 There are a variety of techniques available. This gives the analyst some flexibility in accommodating different types of analysis. Most of the techniques avoid potentially detrimental group influences such as group bias. Typically the techniques used are: the Delphi technique, the Nominal Group Technique and Paired Comparisons. The number and type of experts that are required to participate in the process are similar to that required for Hazard Identification techniques such as HazOp.

1.3 Paired Comparisons is a significant expert judgement technique. Using this technique, an individual makes a series of judgements about pairs of tasks. The results for each individual are analysed and the relative values for HEPs for the tasks derived. Use of the technique rests upon the ability to include at least two tasks with known HEPs. CORE-DATA and data from other industries may be useful.

1.4 The popularity of these techniques has reduced in recent times, probably due to the requirement to get the relevant groups of experts together. However, these techniques may be very appropriate for the maritime industry.

### 2 Technique for Human Error Rate Prediction (THERP)

2.1 THERP is one of the best known and most often utilized human reliability analysis techniques. At first sight the technique can be rather daunting due to the volume of information provided. This is because it is a comprehensive methodology covering task analysis, human error identification, human error modelling and human error quantification. However, it is best known for its human error quantification aspects, which includes a series of human error probability (HEP) data tables and data quantifying the effects of various performance shaping factors (PSFs). The data presented is generally of a detailed nature and so not readily transferable to the marine environment.

2.2 THERP contains a dependence model which is used to model the dependence relationship between errors. For example, the model could be used to assess the dependence between the helmsman making an error and the bridge officer noticing it. Operational experience does show that there are dependence effects between people and between tasks. Whilst this is the only human error model of its type, it has not been comprehensively validated.

2.3 A full THERP analysis can be resource-intensive due to the level of detail required to utilize the technique properly. However, the use of this technique forces the analyst to gain a detailed appreciation of the system and of the human error potential. THERP models humans as any other subsystem in the FSA modelling process. The steps are as follows:

.1 identify all the systems in the operation that are influenced and affected by human operations;

.2 compile a list and analyse all human operations that affect the operations of the system by performing a detailed task analysis;

.3 determine the probabilities of human errors through error frequency data and expert judgements and experiences; and

.4 determine the effects of human errors by integrating the human error into the PRA modelling procedure.

2.4 THERP includes a set of performance shaping factors (PSFs) that influence the human errors at the operator level. These performance factors include experience, situational stress factors, work environment, individual motivation, and the human-machine interface. The PSFs are used as a basis for estimating nominal values and value ranges for human error.

2.5 There are advantages to using THERP. First it is a good tool for relative risk comparisons. It can be used to measure the role of human error in an FSA and to evaluate risk control options not necessarily in terms of a probability or frequency, but in terms of risk magnitude. Also, THERP can be used with the standard event-tree/fault-tree modelling approaches that are sometimes preferred by FSA practitioners. THERP is a transparent technique that provides a systematic, well-documented approach to evaluating the role of human errors in a technical system. The THERP database can be used through systematic analysis or, where available, external human error data can be inserted.

**3 Human Error Assessment Reduction Technique (HEART)**

3.1 HEART is best known as a relatively simple way of arriving at human error probabilities (HEPs). The basis of the technique is a database of nine generic task descriptions and an associated human error probability. The analyst matches the generic task description to the task being assessed and then modifies the generic human error probability according to the presence and strength of the identified error producing conditions (EPCs). EPCs are conditions that increase the order of magnitude of the error frequency or probability measurements, similar in concept to PSFs in THERP. A list of EPCs is supplied as part of the technique, but it is up to the analyst to decide on the strength of effect for the task in question.

3.2 Whilst the generic data is mainly derived from the nuclear industry, HEART does appear amenable to application within other industries. It may be possible to tailor the technique to the marine environment by including new EPCs such as weather. However, it needs careful application to avoid ending up with very conservative estimates of HEPs.

## 4 CORE-DATA

4.1 CORE-DATA is a database of human error probabilities. Access to the database is available through the University of Birmingham in the United Kingdom. The database has been developed as a result of sponsorship by the UK Health and Safety Executive with support from the nuclear, rail, chemical, aviation and offshore industries and contains up to 300 records as of January 1999.

4.2 Each record is a comprehensive presentation of information including, e.g. a task summary, industry origin, country of origin, type of data collection used, a database quality rating, description of the operation, performance shaping factors, sample size and HEP.

4.3 As with all data from other industries, care needs to be taken when transferring the data to the maritime industry. Some of the offshore data may be the most useful.

## Appendix 2

## EXAMPLES OF HAZARDS

### 1 SHIPBOARD HAZARDS TO PERSONNEL

.1 asbestos inhalation;
.2 burns from caustic liquids and acids;
.3 electric shock and electrocution;
.4 falling overboard; and
.5 pilot ladder/pilot hoist operation.

### 2 HAZARDOUS SUBSTANCES ON BOARD SHIP

Accommodation areas:

.1 combustible furnishings;
.2 cleaning materials in stores; and
.3 oil/fat in galley equipment;

Deck areas:

.4 cargo; and
.5 paint, oils, greases etc., in deck stores; and

Machinery spaces:

.6 cabling;
.7 fuel and diesel oil for engines, boilers and incinerators;
.8 fuel, lubricating and hydraulic oil in bilges, save alls, etc.;
.9 refrigerants; and
.10 thermal heating fluid systems.

### 3 POTENTIAL SOURCES OF IGNITION

General:

.1 electrical arc;
.2 friction;
.3 hot surface;
.4 incendiary spark;
.5 naked flame; and
.6 radio waves;

Accommodation areas (including bridge):

.7 electronic navigation equipment; and
.8 laundry facilities – irons, washing machines, tumble driers, etc.

Deck areas:

.9 deck lighting;
.10 funnel exhaust emissions; and
.11 hot work sparking; and

Machinery spaces:

.12 air compressor units; and
.13 generator engine exhaust manifold.

**4 HAZARDS EXTERNAL TO THE SHIP**

.1 storms;
.2 lightning;
.3 uncharted submerged objects; and
.4 other ships.

## Appendix 3

## HAZARD IDENTIFICATION AND RISK ANALYSIS TECHNIQUES

### 1 FAULT TREE ANALYSIS

1.1 A Fault Tree is a logic diagram showing the causal relationship between events which singly or in combination occur to cause the occurrence of a higher level event. It is used in Fault Tree Analysis to determine the probability of a top event, which may be a type of accident or unintended hazardous outcome. Fault Tree Analysis can take account of common cause failures in systems with redundant or standby elements. Fault Trees can include failure events or causes related to human factors.

1.2 The development of a Fault Tree is by a top-down approach, systematically considering the causes or events at levels below the top level. If two or more lower events need to occur to cause the next higher event, this is shown by a logic "and" gate. If any one of two or more lower events can cause the next higher event, this is shown by a logic "or" gate. The logic gates determine the addition or multiplication of probabilities (assuming independence) to obtain the values for the top event.

### 2 EVENT TREE ANALYSIS

2.1 An Event Tree is a logic diagram used to analyse the effects of an accident, a failure or an unintended event. The diagram shows the probability or frequency of the accident linked to those safeguard actions required to be taken after occurrence of the event to mitigate or prevent escalation.

2.2 The probabilities of success or failure of these actions are analysed. The success and failure paths lead to various consequences of differing severity or magnitude. Multiplying the likelihood of the accident by the probabilities of failure or success in each path gives the likelihood of each consequence.

### 3 FAILURE MODE AND EFFECT ANALYSIS (FMEA)

FMEA is a technique in which the system to be analysed is defined in terms of functions or hardware. Each item in the system is identified at a required level of analysis. This may be at a replaceable item level. The effects of item failure at that level and at higher levels are analysed to determine their severity on the system as a whole. Any compensating or mitigating provisions in the system are taken account of and recommendations for the reduction of the severity are determined. The analysis indicates single failure modes which may cause system failure.

### 4 HAZARD AND OPERABILITY STUDIES (HAZOP)

4.1 These studies are carried out to analyse the hazards in a system at progressive phases of its development from concept to operation. The aim is to eliminate or minimize potential hazards.

4.2 Teams of safety analysts and specialists in the subject system, such as designers, constructors and operators are formally constituted. The team members may change at successive phases depending on the expertise required. In examining designs they systematically consider deviations from the intended functions, looking at causes and effects. They record the findings and recommendations and follow-up actions required.

## 5 WHAT IF ANALYSIS TECHNIQUE

5.1 What If Analysis Technique is a hazard identification technique suited for use in a hazard identification meeting. The typical participants in the meeting may be: a facilitator leader, a recorder and a group of carefully selected experienced persons covering the topics under consideration. Usually a group of 7 to 10 persons is required.

5.2 The group first discusses in detail the system, function or operation under consideration. Drawings, technical descriptions etc., are used, and the experts may have to clarify to each other how the details of the system, function or operation work and may fail.

5.3 The next phase of the meeting is brainstorming, where the facilitator leader guides by asking questions starting with "what if?". The questions span topics like operation errors, measurement errors, equipment malfunction, maintenance, utility failure, loss of containment, emergency operation and external influences. When the ideas are exhausted, previous accident experience may be used to check for completeness.

5.4 The hazards are considered in sequence and structured into a logical sequence, in particular to allow cross-referencing between hazards.

5.5 The hazard identification report is usually developed and agreed in the meeting, and the job is done and reported when the meeting is adjourned.

5.6 The technique requires that the participants are senior personnel with detailed knowledge within their field of experience. A meeting typically takes three days. If the task requires long meetings it should be broken down into smaller sub-tasks.

5.7 SWIFT (Structured What If Technique) is one example of a What If Analysis Technique (http://www.dnv.nl/Syscert/training&consultancy.htm).

## 6 RISK CONTRIBUTION TREE (RCT)

6.1 RCT may be used as a mechanism for displaying diagrammatically the distribution of risk amongst different accident categories and sub-categories, as shown in figure 6 of the FSA Guidelines. Structuring the tree starts with the accident categories, which may be divided into sub-categories to the extent that available data allow and logic dictates. The preliminary fault and event trees can be developed based on the hazards identified in step 1 to demonstrate how direct causes initiate and combine to cause accidents (using fault trees), and also how accidents may progress further to result in different magnitudes of loss (using event trees). Whilst the example makes use of fault and event tree techniques, other established methods could be used if appropriate.

6.2 Quantifying the RCT is typically undertaken in three stages using available accident statistics:

.1 categories and sub-categories of accidents are quantified in terms of the frequency of accidents;

.2 the severity of accident outcomes is quantified in terms of magnitude and consequence; and

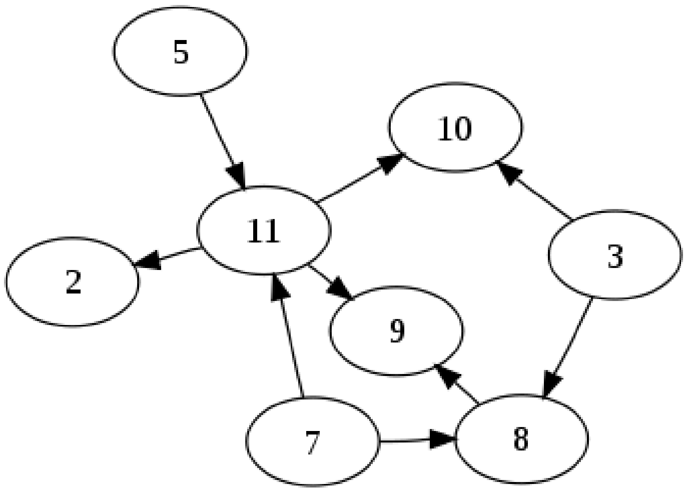
.3 the risk of the categories and sub-categories of accidents can be expressed as F-N curves (see appendix 5) or potential loss of lives (PLL) based on the frequency of accidents and the severity of the outcome of the accidents. Thus, the distribution of risks across all the sub-categories of accidents is determined in risk terms, so as to display which categories contribute how much risk.

## 7 INFLUENCE DIAGRAMS

The purpose of the Influence Diagram approach is to model the network of influences on an event. These influences link failures at the operational level with their direct causes, and with the underlying organizational and regulatory influences. The Influence Diagram approach is derived from decision analysis and, being based on expert judgements, is particularly useful in situations for which there may be little, or no empirical data available. The approach is therefore capable of identifying all the influences (and therefore underlying causal information) that help explain why a marine risk profile may show high risk levels in one aspect (or even vessel type) and low risk level in another aspect. As the Influence Diagram recognizes that the risk profile is influenced, for example by human, organizational and regulatory aspects, it allows a holistic understanding of the problem area to be displayed in a hierarchical way.

## 8 BAYESIAN NETWORK

**Bayesian network** is a probabilistic graphical model (a type of statistical model) that represents a set of random variables and their conditional dependencies via a directed acyclic graph (DAG; see diagram below). For example, a Bayesian network could represent the probabilistic relationships between diseases and symptoms. Given symptoms, the network can be used to compute the probabilities of the presence of various diseases.




## 9 SENSITIVITY ANALYSIS AND UNCERTAINTY ANALYSIS

**Sensitivity analysis** is the study of how the uncertainty in the output of a model (numerical or otherwise) can be apportioned to different sources of uncertainty in the model input. A related practice is uncertainty analysis which focuses rather on quantifying uncertainty in model output. Ideally, uncertainty and sensitivity analysis should be run in tandem.

**Uncertainty analysis** investigates the uncertainty of variables that are used in decision-making problems in which observations and models represent the knowledge base. In other words, uncertainty analysis aims to make a technical contribution to decision-making through the quantification of uncertainties in the relevant variables.

Uncertainty and sensitivity analysis investigate the robustness of a study when the study includes some form of statistical modelling.

## Appendix 4

## INITIAL RANKING OF ACCIDENT SCENARIOS

1 At the end of step 1, hazards are to be prioritized and scenarios ranked. Scenarios are typically the sequence of events from the initiating event up to the consequence, through the intermediate stages of the scenario development.

2 To facilitate the ranking and validation of ranking, it is generally recommended to define consequence and probability indices on a logarithmic scale. A risk index may therefore be established by adding the probability/frequency and consequence indices. By deciding to use a logarithmic scale, the Risk Index for ranking purposes of an event rated "remote" (FI=3) with severity "Significant" (SI=2) would be RI=5.

$$\text{Risk} = \text{Probability x Consequence}$$
$$\text{Log (Risk)} = \text{log (Probability) + log (Consequence)}$$

3 The following table gives an example of a logarithmic severity index, scaled for a maritime safety issue. Consideration of environmental issues or of passenger vessels may require additional or different categories.

| **Severity Index** | | | | |
|---|---|---|---|---|
| SI | SEVERITY | EFFECTS ON HUMAN SAFETY | EFFECTS ON SHIP | S (Equivalent fatalities) |
| 1 | Minor | Single or minor injuries | Local equipment damage | 0.01 |
| 2 | Significant | Multiple or severe injuries | Non-severe ship damage | 0.1 |
| 3 | Severe | Single fatality or multiple severe injuries | Severe damage | 1 |
| 4 | Catastrophic | Multiple fatalities | Total loss | 10 |

4 The following table gives an example of a logarithmic probability/frequency index.

| Frequency Index | | | |
|---|---|---|---|
| FI | FREQUENCY | DEFINITION | F (per ship year) |
| 7 | Frequent | Likely to occur once per month on one ship | 10 |
| 5 | Reasonably probable | Likely to occur once per year in a fleet of 10 ships, i.e. likely to occur a few times during the ship's life | 0.1 |
| 3 | Remote | Likely to occur once per year in a fleet of 1,000 ships, i.e. likely to occur in the total life of several similar ships | $10^{-3}$ |
| 1 | Extremely remote | Likely to occur once in the lifetime (20 years) of a world fleet of 5,000 ships. | $10^{-5}$ |

5 The following table gives an example of a risk matrix based on the tables above.

| Risk Index (RI) | | | | | |
|---|---|---|---|---|---|
| | | SEVERITY (SI) | | | |
| | | 1 | 2 | 3 | 4 |
| FI | FREQUENCY | Minor | Significant | Severe | Catastrophic |
| 7 | Frequent | **8** | **9** | **10** | **11** |
| 6 | | **7** | **8** | **9** | **10** |
| 5 | Reasonably probable | **6** | **7** | **8** | **9** |
| 4 | | **5** | **6** | **7** | **8** |
| 3 | Remote | **4** | **5** | **6** | **7** |
| 2 | | **3** | **4** | **5** | **6** |
| 1 | Extremely remote | **2** | **3** | **4** | **5** |

6 In case of FSA on prevention of oil spill from ships, the following severity index can be used.

| Severity Index | | |
|---|---|---|
| SI | SEVERITY | DEFINITION |
| 1 | Category 1 | Oil spill size < 1 tonne |
| 2 | Category 2 | Oil spill size between 1-10 tonnes |
| 3 | Category 3 | Oil spill size between 10-100 tonnes |
| 4 | Category 4 | Oil spill size between 100-1,000 tonnes |
| 5 | Category 5 | Oil spill size between 1,000-10,000 tonnes |
| 6 | Category 6 | Oil spill size >10,000 tonnes |

## Appendix 5

## MEASURES AND TOLERABILITY OF RISKS

### 1 INTRODUCTION

The following information on measures and tolerability of risks is provided for conceptual understanding and is not intended to provide prescriptive thresholds for acceptability of risks.

### 2 TERMINOLOGY

**Individual Risk (IR)**: The risk of death, injury and ill health as experienced by an individual at a given location, e.g. a crew member or passenger on board the ship, or belonging to third parties that could be affected by a ship accident. Usually IR is taken to be the risk of death and is determined for the maximally exposed individual. Individual Risk is person and location specific.

$$IR_{for\ Person\ Y} = F_{of\ undesired\ Event} * P_{for\ Person\ Y} * E_{of\ Person\ Y}$$

$F$ = frequency
$P$ = resulting casualty probability
$E$ = fractional exposure to that risk

**Societal Risk**: Average risk, in terms of fatalities, experienced by a whole group of people (e.g. crew, port employees, or society at large) exposed to an accident scenario. Usually Societal Risk is taken to be the risk of death and is typically expressed as FN-diagrams or Potential Loss of Life (PLL) (refer to section 2). Societal Risk is determined for the all exposed, even if only once a year. Societal Risk is not person and location specific.

**FN-Curve**: A continuous graph with the ordinate representing the cumulative frequency distribution of N or more fatalities and the abscissa representing the consequence (N fatalities). The FN-curve represents the cumulative distribution of multiple fatality events and therefore useful in representing societal risk. The FN-curve is constructed by taking each hazard or accident scenario in turn and estimating the number of fatalities. With the estimated frequency of occurrence of each accident scenario the overall frequency with which a given number of fatalities may be equalled or exceeded can be calculated and plotted in the form of an FN-curve.

**ALARP (As Low As Reasonably Practicable)**: Refers to a level of risk that is neither negligibly low nor intolerable high. ALARP is actually the attribute of a risk, for which further investment of resources for risk reduction is not justifiable. The principle of ALARP is employed for the risk assessment procedure. Risks should be As Low As Reasonably Practicable. It means that accidental events whose risks fall within this region have to be reduced unless there is a disproportionate cost to the benefits obtained.

### 3 PRINCIPLES OF RISK EVALUATION

Risk can be expressed in several complementary fashions. Concerning life safety, the most commonly used expressions are Individual Risk and Societal Risk. This is risk of death, injuries and ill health experienced by an individual and/or a group of people. The notion of risk combines frequency and an identified level of harm. Commonly, the level of harm is narrowed down to the loss of life and risk is an expression of frequency and number of fatalities. In other words, life safety is usually taken to refer to the risk of loss of life, and usually expressed as fatalities per year. In order to address not only fatalities, but also disabilities and injuries, the Equivalent Fatality Concept as specified below is advocated. Risk should at least be judged from two viewpoints. The first point of view is that of the individual, which is dealt with by the Individual Risk. The second point of view is that of society, considering whether a risk is acceptable for (large) group of people. This is dealt with by the Societal Risk.

**3.1 The use of Individual Risk**

3.1.1 This risk expression is used, when the risk from an accident is to be estimated for a particular individual at a given location. Individual Risk considers not only the frequency of the accident and the consequence (here: fatality or injury), but also the individual's fractional exposure to that risk, i.e. the probability of the individual of being in the given location at the time of the accident.

3.1.2 Example: The risk for a person to be killed or injured in a harbour area, due to a tanker explosion is the higher the closer the person is located to the explosion location, and the more likely the person will be in that location at the time of the explosion. Therefore, the Individual Risk for a worker in the vicinity of the explosion will be higher than for an occupant in the neighbourhood of the harbour terminal.

3.1.3 The purpose of estimating the Individual Risk is to ensure that individuals, who may be affected by a ship accident, are not exposed to excessive risks.

**3.2 The use of Societal Risk**

3.2.1 Societal Risk is used to estimate risks of accidents affecting many persons, e.g. catastrophes, and acknowledging risk averse or neutral attitudes. Societal Risk includes the risk to every person, even if a person is only exposed on one brief occasion to that risk. For assessing the risk to a large number of affected people, Societal Risk is desirable because Individual Risk is insufficient in evaluating risks imposed on large numbers of people. Societal Risk expressions can be generated for each type of accident (e.g. collision), or a single overall Societal Risk expression can be obtained, e.g. for a ship type, by combining all accidents together (e.g. collision, grounding, fire). Societal Risk may be expressed as:

.1 FN-diagrams showing explicitly the relationship between the cumulative frequency of an accident and the number of fatalities in a multidimensional diagram.

.2 Annual fatality rate: frequency and fatality are combined into a convenient one-dimensional measure of societal risk. This is also known as Potential Loss of Life (PLL).

***FN diagrams***

3.2.2 Society in general has a strong aversion to multiple casualty accidents. There is a clear perception that a single accident that kills 1,000 people is worse than 1,000 accidents that kill a single person. Societal Risk expressed by an FN-diagram show the relationship between the frequency of an accident and the number of fatalities (see figure 1 below).

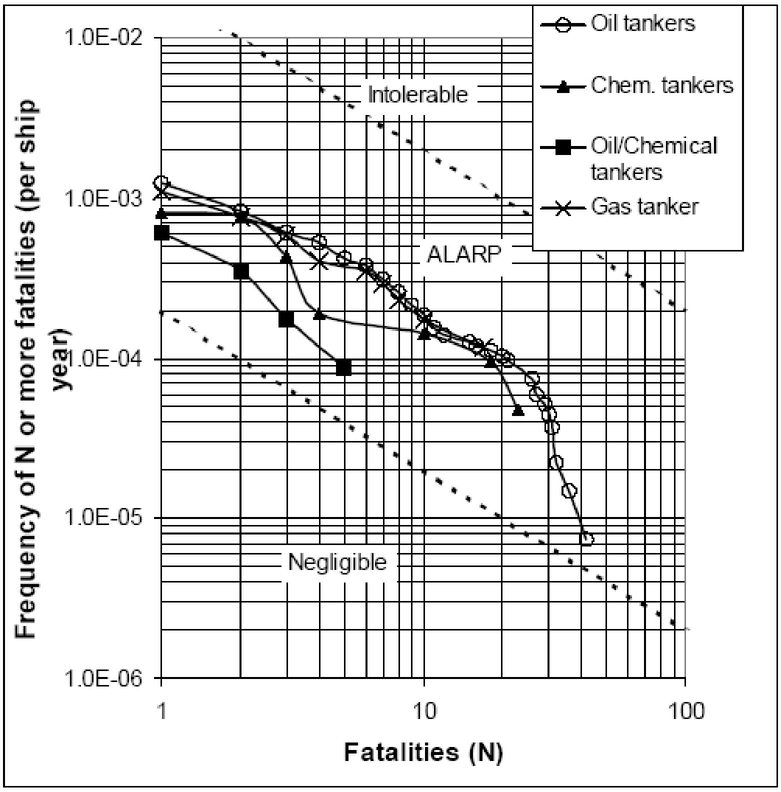



**Figure 1: FN-diagram *(from MSC 72/16)***

***Potential Loss of Life (PLL)***

3.2.3 A simple measure of Societal Risk is the PLL which is defined as the expected value of the number of fatalities per year. PLL is a type of risk integral, being a summation of risk as expressed by the product of consequence and frequency. The integral is summed up over all potential undesired events that can occur.

3.2.4 Compared to the FN-diagram, the distinction between high frequency/low consequence accidents and low frequency/high consequence accidents is lost: all fatalities are treated as equally important, irrespective of whether they occur in high fatality or low fatality accidents. PLL is a simpler format of Societal Risk than the FN-diagram. PLL is typically measured as fatality per ship-year.

**3.3 Comparing Societal Risk and Individual Risk**

3.3.1 Societal Risk expressed in an FN-diagram allows a more comprehensive picture of risk than Individual Risk measures. The FN-diagram allows the assessment not only of the average number of fatalities but also of the risk of catastrophic accidents killing many people at once.

3.3.2 However, unlike Individual Risk, both FN-diagrams and PLL values give no indication of the geographical distribution of a particular risk. Societal Risk represents the risk to a (large) group of people. In this group, the risk to individuals may be quite different, depending, e.g. on the different locations of the individuals when the accident occurs. The Societal Risk value therefore represents an average risk. There is a general agreement in society that it is not sufficient to just achieve a minimal average risk. It is also necessary to reduce the risk to the most exposed individual. It is therefore adequate to look at both Societal Risk and Individual Risk to achieve a full risk picture.

3.3.3 Societal Risk is difficult to apply to the task of risk reduction, specifically because it is multidimensional.

### 3.4 Risk equivalence concept

3.4.1 Normally, from a given activity in industry, there tends to be a relationship between fatalities and injuries of different severities resulting from an accident. Furthermore, measures that will reduce the occurrence of fatalities also tend to reduce injuries in proportion. In the literature there exist some studies on the ratio between accidental outcomes, e.g. from Bird and German (1966). In document MSC 68/INF.6, a straightforward approach was introduced, suggesting an equivalence ratio between fatalities, major injuries and minor injuries:

.1 one (1) fatality equals ten (10) severe injuries; and

.2 one (1) severe injury equals ten (10) minor injuries.

3.4.2 The QALY and DALY concepts (refer to appendix 7) would represent more general approaches for measuring injuries and health effects, and are used by e.g. the World Health Organization (WHO).

## 4 ALARP PRINCIPLE

By using different forms of risk expressions, risk criteria can be created that meet the requirement of different principles. The commonly accepted principle is known as the ALARP principle. Risk criteria are used to translate a risk level into value judgement.

### 4.1 General

4.1.1 The purpose of FSA is to reduce the risk to a level that is tolerable. IMO has a moral responsibility to limit the risks to people life and health, to the marine environment and to property. In addition, IMO should also account for maintaining a healthy industry. Spending resources regulations whose benefits are grossly disproportionate to their costs will put the industry in a less than competitive position.

4.1.2 This is realized in the ALARP principle, which is shown in figure 2.

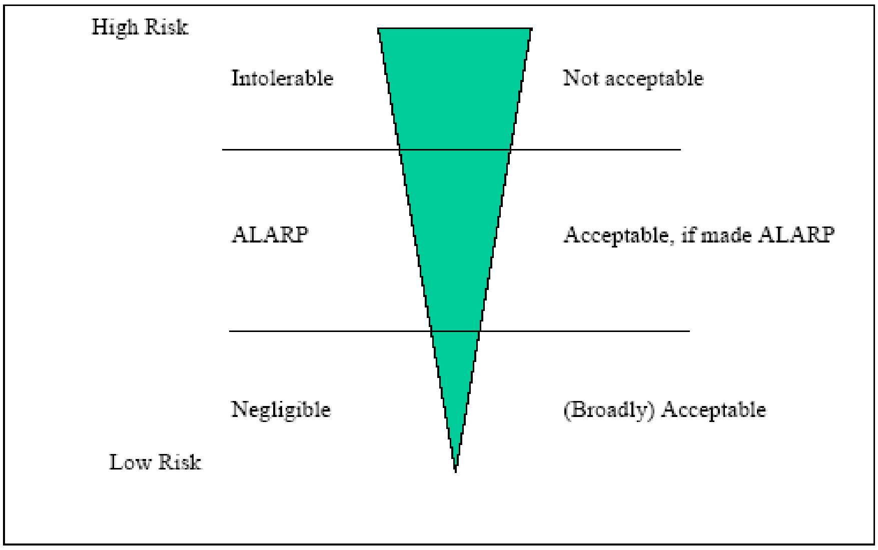



**Figure 2: The ALARP principle**

4.1.3 It states that there is a risk level that is intolerable above an upper bound. In this region, risk cannot be justified and must be reduced, irrespectively of costs. The principle also states that there is a risk level that is 'broadly acceptable' below a lower bound. In this region risk is negligible and no risk reduction required. If the risk level is in between the two bounds, the ALARP region, risk should be reduced to meet economic responsibility: Risk is to be reduced to a level as low as is reasonably practicable. The term reasonable is interpreted to mean cost-effective. Risk reduction measures should be technically practicable and the associated costs should not be disproportionate to the benefits gained. This is examined in a cost-effectiveness analysis.

### 4.2 Cost-effectiveness Analysis (CEA)

With this approach the amount of risk reduction that can be justified in the ALARP region is determined. Several researchers have proven that most risks in shipping fall into this region. As such, most of risk-based decisions will require a CEA. However, it should be noted that this has not yet been verified for all ship types. There are several indices which express cost-effectiveness in relation to safety of life such as GCAF and NCAF, as described in appendix 7.

## 5 RECOMMENDED RISK EVALUATION CRITERIA

### 5.1 Individual Risk

5.1.1 Individual Risk criteria for hazardous activities are often set using risk levels that have already been accepted from other industrial activities.

5.1.2 The level of risk that will be accepted for an individual depends upon two aspects:

.1 if the risk is taken involuntarily or voluntarily; and

.2 if the individual has control over the risk or no control.

5.1.3 If a person is voluntarily exposing himself to a risk and/or has some control over it, then the risk level that is accepted is higher as if this person was exposed involuntarily to that risk or had no control over it.

5.1.4 For example: A passenger on a cruise ship or an occupant living in the vicinity of a port have little or no control over the risks they are exposed to from the ship and/or the port activity. They are involuntarily exposed to risks. A crew member on a ship, instead, has chosen his work place on a voluntary basis, and due to skills and training has some control over the risks he/she is exposed to at the work place.

5.1.5 An appropriate level for the risk acceptance criteria would be substantially below the total accident risks experienced in daily life, but might be similar to risks that are accepted from other involuntary sources.

5.1.6 The lower and upper bound risk acceptance criteria as listed in table 1 are provided for illustrative purposes only. The specific values selected as appropriate should be explicitly defined in FSA studies.

### 5.2 Societal Risk/FN-Diagram

5.2.1 When setting upper and lower bounds for societal risk acceptance, both an anchor point and a slope should be defined. The slope reveals the risk inherent attitude: risk prone, neutral or averse. It is recommended to use a slope equal of -1 on a log/log scale to reflect the risk aversion.

5.2.2 In document MSC 72/16 it was pointed out that Societal Risk acceptance criteria cannot be simply transferred from one industrial activity to another. This could lead to illogical and unpredictable results. A method was introduced where the Societal Risk acceptance criteria reflect the importance of the activity to the society (for more detail, refer to document MSC 72/16, Skjong and Eknes (2001, 2002)).

5.2.3 For a given activity, an average acceptable Potential Loss of Life (PLL) is developed by considering the economic value of the activity and its relation to the gross national product. This can be done for crew/workers, passengers and other third parties. The risk is defined to be intolerable if it exceeds the average acceptable risk by more than one order of magnitude, and it is negligible (broadly acceptable), if it is one order of magnitude below the average acceptable risk. These upper and lower bounds represent the ALARP region, which thus ranges over two orders of magnitude, which is in agreement with other published Societal Risk acceptance criteria.

5.2.4 It is recommended to apply this method to define Societal Risk acceptance criteria on different ship types and/or marine activities, as the method can contribute to transparency in using risk acceptance criteria for Societal Risk. In document MSC 72/16, Societal Risk criteria developed with this method and expressed in FN-diagrams are provided for different ship types.

### 5.3 Examples of risk acceptance criteria

5.3.1 The following criteria are broadly used in other industries and have been also published in HSE (2001).

| Decision Parameter | | Acceptance Criteria | |
|---|---|---|---|
| | | Lower bound for ALARP region | Upper bound for ALARP region |
| | | Negligible (broadly acceptable) fatality risk per year | Maximum tolerable fatality risk per year |
| Individual Risk | to crew member | $10^{-6}$ | $10^{-3}$ |
| | to passenger | $10^{-6}$ | $10^{-4}$ |
| | to third parties, member of public ashore | $10^{-6}$ | $10^{-4}$ |
| | target values for new ships *) | $10^{-6}$ | Above values to be reduced by one order of magnitude |
| Societal Risk | to groups of above persons | To be derived by using economic parameters as per MSC 72/16 | |

**Table 1: Quantitative risk evaluation upper and lower bounds**

*) While it is recommended that the maximum tolerable criteria for Individual Risk as listed should apply to all ships, it is proposed, in accordance with MSC 72/16, that for comprehensive FSA studies for new ships a more demanding target is appropriate.

5.3.2 It is important to understand, that the above risk acceptance criteria always refer to the total risk to the individual and/or group of persons. Total risk means the sum of all risks that, e.g. a person on board a ship is exposed to. The total risk therefore would contain risks from hazards such as fire, collision, etc. There is no criterion available to determine the acceptability of specific hazards. Therefore, the above criteria can be used to assess the acceptability of the total risk on being, e.g. on a passenger ship, but not for assessing the specific risk of dying on a passenger ship due to a fire.

## Appendix 6

## ATTRIBUTES OF RISK CONTROL MEASURES

### 1 CATEGORY A ATTRIBUTES

1.1 **Preventive risk control** is where the risk control measure reduces the probability of the event.

1.2 **Mitigating risk control** is where the risk control measure reduces the severity of the outcome of the event or subsequent events, should they occur.

### 2 CATEGORY B ATTRIBUTES

2.1 **Engineering risk control** involves including safety features (either built in or added on) within a design. Such safety features are safety critical when the absence of the safety feature would result in an unacceptable level of risk.

2.2 **Inherent risk control** is where at the highest conceptual level in the design process, choices are made that restrict the level of potential risk.

2.3 **Procedural risk control** is where the operators are relied upon to control the risk by behaving in accordance with defined procedures.

### 3 CATEGORY C ATTRIBUTES

3.1 **Diverse risk control** is where the control is distributed in different ways across aspects of the system, whereas concentrated risk control is where the risk control is similar across aspects of the system.

3.2 **Redundant risk control** is where the risk control is robust to failure of risk control, whereas **single risk control** is where the risk control is vulnerable to failure of risk control.

3.3 **Passive risk control** is where there is no action required to deliver the risk control measure, whereas **active risk control** is where the risk control is provided by the action of safety equipment or operators.

3.4 **Independent risk control** is where the risk control measure has no influence on other elements.

3.5 **Dependent risk control** is where one risk control measure can influence another element of the risk contribution tree.

3.6 **Involved human factors** is where human action is required to control the risk but where failure of the human action will not in itself cause an accident or allow an accident sequence to progress.

3.7 **Critical human factors** is where human action is vital to control the risk either where failure of the human action will directly cause an accident or will allow an accident sequence to progress. Where a **critical human factor** attribute is assigned, the human action (or critical task) should be clearly defined in the risk control measure.

3.8 **Auditable** or **Not Auditable** reflects whether the risk control measure can be audited or not.

3.9 **Quantitative** or **Qualitative** reflects whether the risk control measure has been based on a quantitative or qualitative assessment of risk.

3.10 **Established** or **Novel** reflects whether the risk control measure is an extension to existing marine technology or operations, whereas novel is where the measure is new. Different grades are possible, for example the measure may be novel to shipping but established in other industries or it is novel to both shipping and other industries.

3.11 **Developed** or **Non-developed** reflects whether the technology underlying the risk control measure is developed both in its technical effectiveness and its basic cost. Non-developed is either where the technology is not developed but it can be reasonably expected to develop, or its basic cost can be expected to reduce in a given timescale. The purpose of considering this attribute is to attempt to anticipate development and produce forward looking measures and options.

**Appendix 7**

**EXAMPLE OF CALCULATION OF INDICES FOR COST-EFFECTIVENESS**

## I INDICES FOR COST-EFFECTIVENESS ON SAFETY

### 1 Introduction

The purpose of this appendix is to suggest a set of cost-effectiveness criteria, which may be used in FSA studies. The use of these cost-effectiveness criteria would enable the FSA studies to be conducted in a more consistent manner, making results and the way they were achieved better comparable and understandable. This appendix provides clarification on available criteria to assess the cost-effectiveness of risk control options, so-called cost-effectiveness criteria. It is also recommended how these criteria should be applied.

### 2 Terminology

**DALY (Disability Adjusted Life Years)/QALY (Quality Adjusted Life Years)**: The basic idea of a QALY is one year of perfect health-life expectancy to be worth 1, but regards one year of less than perfect health-life expectancy as less than 1. Unlike QALY, the DALY assigns that one year of perfect health-life to be 0 and one year of less than perfect as more than 0.

**LQI (Life Quality Index)**: The index for expressing the social, health, environment and economic dimensions of the quality of life at working conditions. The LQI can be used to comment on key issues that affect people and contribute to the public debate about how to improve the quality of life in our communities.

**GCAF (Gross Cost of Averting a Fatality)**: A cost-effectiveness measure in terms of ratio of marginal (additional) cost of the risk control option to the reduction in risk to personnel in terms of the fatalities averted; i.e.

$$GCAF = \frac{\Delta Cost}{\Delta Risk}$$

**NCAF (Net Cost of Averting a Fatality)**: A cost-effectiveness measure in terms of ratio of marginal (additional) cost, accounting for the economic benefits of the risk control option to the reduction in risk to personnel in terms of the fatalities averted, i.e.

$$NCAF = \frac{\Delta Cost - \Delta EconomicBenefit}{\Delta Risk} = GCAF - \frac{\Delta EconomicBenefit}{\Delta Risk}$$

### 3 NCAF and GCAF

3.1 The common criteria used for estimating the cost-effectiveness of risk reduction measures are NCAF and GCAF. In principle there are several approaches to derive NCAF and GCAF criteria:

.1 Observation of the Willingness-To-Pay to avert a fatality;

.2 Observation of past decisions and the costs involved with them; and

.3 Consideration of societal indicators such as the Life Quality Index (LQI).

For further detail, reference is made to Nathwani et al., Rackwitz (2002).

3.2 The proposed values for NCAF and GCAF in table 2 were derived by considering societal indicators (refer to document MSC 72/16, UNDP 1990, Lind 1996). They are provided for illustrative purposes only. The specific values selected as appropriate and used in an FSA study should be explicitly defined. These criteria given in table 2 are not static, but should be updated every year according to the average risk free rate of return (approximately 5%) or by use of the formula based on LQI (Nathwani et al. (1996), Skjong and Ronold (1998, 2002), Rackwitz (2002 a,b).

| | NCAF [US $] | GCAF [US $] |
|---|---|---|
| criterion covering risk of fatality, injuries and ill health | 3 million | 3 million |
| criterion covering only risk of fatality *) | 1.5 million | 1.5 million |
| criterion covering only risk of injuries and ill health *) **) | 1.5 million | 1.5 million |

**Table 2: Cost Effectiveness Criteria**

*) NCAF and GCAF criteria are normally used covering not only fatalities from accidents, but implicitly also injuries and/or ill health from them. This is an adequate approach, because, as was mentioned above, many accidents involve both consequence categories: fatalities and injuries/ill health.

However, if accidents are analysed that involve only one of the two categories, the criteria should be adjusted to cover explicitly only the category relevant to the accident under consideration. In MSC 72/16 a proposal was made, that the NCAF and GCAF criteria are split equally for the two consequence categories.

**) refer also to QALY approach

3.3 It is recommended that the following approach is applied in using GCAF and NCAF criteria:

.1 GCAF or NCAF:
In principle, either of the two criteria can be used. However, it is recommended to firstly consider GCAF instead of NCAF. The reason is that NCAF also takes into account economic benefits from the RCOs under consideration. This may be misused in some cases for pushing certain RCOs, by considering more economic benefits on preferred RCOs than on other RCOs.

If the cost-effectiveness of an RCO is in the range of criterion, then NCAF may be also considered.

.2 Negative NCAF:
Recent FSA studies have come up with some risk control options (RCO) where the associated NCAF was negative. Assuming that the RCO has a positive risk reduction potential $\Delta R$ (i.e. reduces the risk), a negative NCAF means that the benefits in monetary units are higher than the costs associated with the RCO. It should be noted that a high negative NCAF with positive $\Delta R$ may result from either of the following two facts:

2.1 the benefits are much higher than the costs associated with the RCO; or

2.2 the RCO has a low risk reduction potential $\Delta R$ (the lower $\Delta R$, the higher is the NCAF, refer to formula (2)).

3.4 Therefore, RCOs with high negative NCAFs should always be considered in connection with the associated risk reduction capability.

***QALY and/or DALY***

3.5 The QALY or DALY criterion can be used for risks that only involve injuries and/or ill health, but no fatalities. It can be derived from the GCAF criterion, by assuming that one prevented fatality implies 35 Quality Adjusted Life Years gained (refer to document MSC 72/16):

QALY = GCAF (covering injuries/ill health) / 35 = US$42,000.

## II ENVIRONMENTAL RISK EVALUATION CRITERIA ON PREVENTION OF OIL SPILL FROM SHIPS

Noting that the most appropriate conversion formula to use will depend on the specific scope of each FSA to be performed, a general approach to be followed is outlined in the following suggested examples.

**Cost for compensating oil spills**

1 Consolidated oil spill database based on:

IOPCF data;
US Data;
Norwegian data.

Figure 1 shows the data of the consolidated oil spill database in terms of specific costs per tonne spilled (figure 5 of document MEPC 62/INF.24). Further information with respect to the basis of the database can be found in document MEPC 62/INF.24. It should be acknowledged that the consolidated oil spill database has limitations and possible deficiencies. These are described in document MEPC 62/INF.24 and may also involve incomplete or missing data on costs or other information.

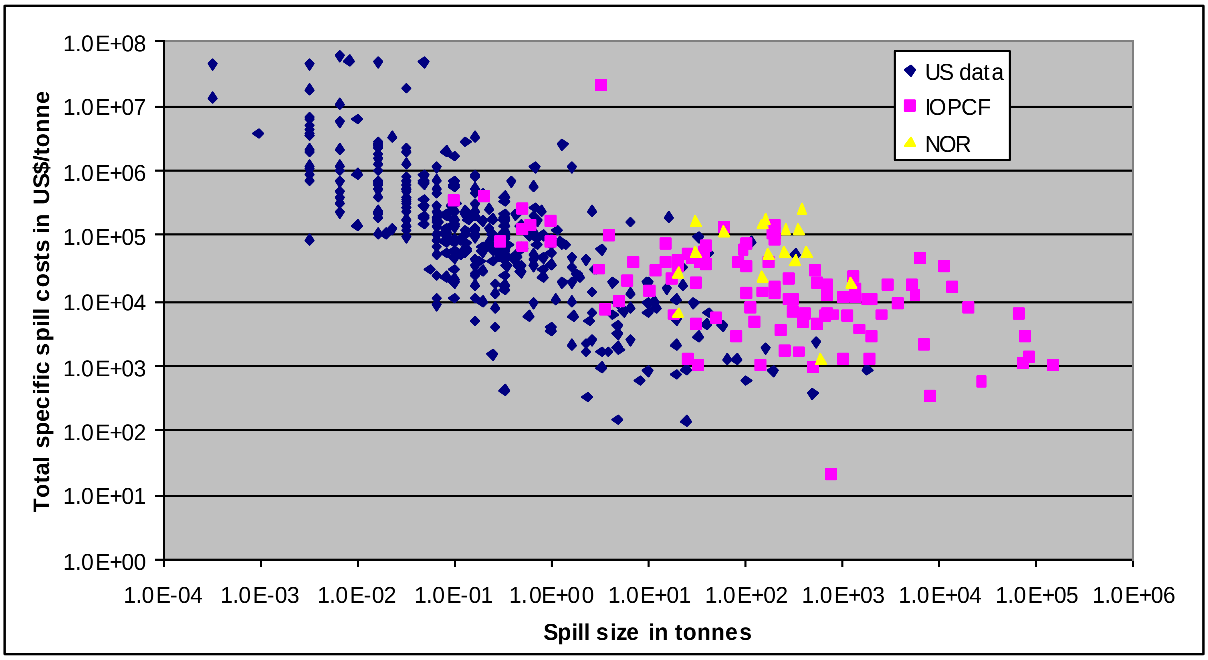



**Figure 1: All specific oil spill cost data in 2009 USD (spill cost per tonne). Source: document MEPC 62/INF.24**

The submitter of the FSA can amend this database with new oil spill data, however, this amendment should be properly documented.

2 Some regression formulae derived from the consolidated oil spill database are summarized in table 1 in which V is spill size in tonnes.

**Table 1: Regression formulae derived from the consolidated database**

| Dataset | f(V)=Total Spill Cost (TSC) (2009 US dollars) | Reference |
|---|---|---|
| All spills | $67{,}275\ V^{0.5893}$ | MEPC 62/INF.24 |
| V>0.1 tonnes | $42{,}301\ V^{0.7233}$ | MEPC 62/18[1] |

FSA analysts are free to use other conversion formulae, so long as these are well documented by the data. For example, if an FSA is considering only small spills, the submitter may filter the data and perform his or her own regression analysis.

1 Updated regression made on the final consolidated dataset.

3 It is recommended that the FSA analyst use the following formula to estimate the societal oil spill costs (SC) used in the analysis:

$$SC(V) = F_{Assurance} * F_{Uncertainty} * f(V)$$

This equation considers:

1. Assurance factor ($F_{Assurance}$): allowing for society's willingness to pay to avert accidents;

2. Uncertainty factor ($F_{Uncertainty}$): allowing for uncertainties in the cost information from occurred spill accidents; and

3. Volume-dependent total cost function (*f(V)*): representing the fact that the cost per unit oil spilled decreases with the spill size in US$ per tonne oil spilled.

The values of both assurance and uncertainty factors should be well documented.
**In addition, if value of $F_{Assurance}$ and $F_{Uncertainty}$ other than 1.0 are used, a cost-effective analysis using $F_{Assurance}$= 1.0 and $F_{Uncertainty}$ = 1.0 should be included in the FSA results, for reference.**

In order to consider the large scatter, the FSA analyst may perform a regression to determine a function *f(V)* that covers a percentile different than 50 % and document it in the report.

**Application in RCO evaluation**

4 The FSA analyst should perform a cost-benefit and cost-effectiveness evaluation of the RCOs identified and provide all relevant details in the report, as outlined below.

4.1 RCOs affecting oil spills only

In case an RCO affects oil spills only:

**RCO is cost effective if ΔC < ΔSC**

ΔC = Expected cost of the RCO

ΔSC = (Expected SC **without** the RCO) **–** (Expected SC **with** the RCO) = Expected benefit of the RCO

4.2 RCOs affecting both safety and environment

In case of RCOs addressing both safety and environment the following formula is recommended:

NCAF = (ΔC – ΔSC) / ΔPLL

In the above,

$\Delta C$ = Expected cost of the RCO
$\Delta SC$ = (Expected SC **without** the RCO) – (Expected SC **with** the RCO) = Expected benefit of the RCO
$\Delta PLL$ = Expected reduction of fatalities due to the RCO

The criteria for NCAF are as per table 2 of appendix 7 of document MSC 83/INF.2.

In case there is an economic benefit ($\Delta B$), $\Delta C$ should be replaced by $\Delta C$-$\Delta B$.

It is also emphasized that all cost and benefit components of the cost-benefit or cost-effectiveness inequality should be shown in an FSA study for better transparency.

**Other indices**

5 The user is free to develop new approaches, taking into account the objectives of the FSA.

## Appendix 8

## STANDARD FORMAT FOR REPORTING AN APPLICATION OF FORMAL SAFETY ASSESSMENT TO IMO

1 This standard format is intended to facilitate the compilation of the results of applications according to the *Guidelines for Formal Safety Assessment (FSA) for use in the IMO rule-making process* and the consistent presentation of those results to IMO.

2 Interested parties having carried out an FSA application should provide the most significant results in a clear and concise manner, which can also be understood by other parties not having the same experience in the application of risk assessment techniques.

3 The report of an FSA application should contain an executive summary and the following sections: definition of the problem, background information, method of work, description of the results achieved in each step and final recommendations arising from the FSA study.

4 The level of detail of the report depends on the problem under consideration. In order for users and reviewers to understand the results of FSA, the results of the FSA should be reported by:

.1 a summary report of limited length (i.e. maximum 20 pages);

.2 a full report that includes a detailed presentation and an explanation; and

.3 if necessary, background data on an Internet site which is accessible by reviewers of the Organization.

5 Those submitting the results of the FSA application should provide the other interested parties with timely and open access to relevant supporting documentation and sources of information or data which are referred to in the above-mentioned report, as reflected in paragraph 9.2.1 of the FSA Guidelines.

6 The following section presents the standard format of FSA application reports. The subjects expected to be presented in each section of the report are listed in italic characters and reference is made, in brackets, to the relevant paragraph(s) of the FSA Guidelines.

## STANDARD REPORTING FORMAT

### 1 TITLE OF THE APPLICATION OF FSA

### 2 SUMMARY (maximum 1/2 page)

*2.1 Executive summary: scope of the application and reference to the paragraph defining the problem assessed and its boundaries.*

*2.2 Actions to be taken: type of action requested (e.g. for information or review) and summary of the final recommendations listed in section 7.*

*2.3 Related documents: reference to any supporting documentation.*

**3 DEFINITION OF THE PROBLEM** (maximum 1 page)

*3.1 Definition of the problem to be assessed in relation to the proposal under consideration by the decision-makers.*

*3.2 Reference to the regulation(s) affected by the proposal to be reviewed or developed (in an annex).*

*3.3 Definition of the generic model ( e.g. functions, features, characteristics or attributes which are relevant to the problem under consideration, common to all ships of the type affected by the proposal).*

(refer to paragraphs 4.1 and 4.2 of the FSA Guidelines)

**4 BACKGROUND INFORMATION** (maximum 3 pages)

**4.1 Lessons learned from recently introduced measures to address similar problems.**

*4.2* Casualty statistics concerning the problem under consideration (e.g. ship types or accident category) including data analysis (i.e. time dependence, ship size influence, variability assessment, hypothesis testing, etc.).

**4.3 Any other sources of data and relevant limitations.**

(refer to paragraph 3.2 of the FSA Guidelines)

**5 METHOD OF WORK** (maximum 3 pages)

*5.1* Composition and expertise of those having performed each step of the FSA process by providing e.g.name and expertise of the experts involved in the application and name and contact point (e-mail address, telephone number and mailing address) of the coordinator of the FSA.

*5.2* Description of how the assessment has been conducted in terms of organization of working groups and, method of decision-making in the group(s) that performed each step of the FSA process.

**5.3 Start and finish date of the assessment.**

(refer to paragraph 3.1.1.2 of the FSA Guidelines)

**6 DESCRIPTION OF THE RESULTS ACHIEVED IN EACH STEP**
(maximum 10 pages)

*For each step, describe:*

*.1 method and techniques used to carry out the assessment;*

*.2 assumptions, limitations or uncertainties and the basis for them; and*

*.3 outcomes of each step of the FSA methodology, including:*

*STEP 1 – HAZARD IDENTIFICATION:*
(refer to paragraph 5.3 of the FSA Guidelines)

- *prioritized list of hazards* and description of their associated scenarios
- *identified significant accident scenarios* including causes and initiating events in line with the scope of the FSA

*STEP 2 – RISK ANALYSIS:*
(refer to paragraph 6.3 of the FSA Guidelines)

- *types of risk (e.g. individual, societal, environmental, business)*
- *presentation of the distribution of risks depending on the problem under consideration*
- *identified significant risks*
- *principal influences that affect the risks*
- *sources of accident and reliability statistics*

*STEP 3 – RISK CONTROL OPTIONS:*
(refer to paragraph 7.3 of the FSA Guidelines)

- *what hazards are covered by current regulations*
- *identified risk control options*
- *assessment of the control options as a function of their effectiveness against risk reduction*

*STEP 4 – COST-BENEFIT ASSESSMENT:*
(refer to paragraph 8.3 of the FSA Guidelines)

- *identified types of cost and benefits involved for each risk control option*
- *cost-benefit assessment for the entities which are influenced by each option*
- *identification of the cost-effectiveness expressed in terms of cost per unit risk reduction*

*STEP 5 – RECOMMENDATIONS FOR DECISION-MAKING*
(refer to paragraph 9.3 of the FSA Guidelines)

- *objective comparison of alternative options*
- *discussion on how recommendations could be implemented by decision-makers*

**7 FINAL RECOMMENDATIONS FOR DECISION-MAKING** (maximum 2 1/2 pages)

*List of final recommendations, ranked and justified in an auditable and traceable manner.* (refer to paragraph 9.3 of the FSA Guidelines)

**ANNEXES** (as necessary)

*.1* explanation of the background of each expert (e.g. a short curriculum vitae) and the basis of selection of the experts*;*
*.2* *list of references;*
*.3* *sources of data;*
*.4* *accident statistics;*
*.5* *technical support material; and*
*.6* *any further information.*

## Appendix 9

## DEGREE OF AGREEMENT BETWEEN EXPERTS CONCORDANCE MATRIX

1 Experts are sometimes used to rank risks associated with accident scenarios, or to rank the frequency or severity of hazards. One example is the ranking that takes place at the end of FSA Step 1 – Hazard Identification. This is a subjective ranking, where each expert may develop a ranked list of accident scenarios, starting with the most severe. To enhance the transparency in the result, the resulting ranking should be accompanied by a concordance coefficient, indicating the level of agreement between the experts.

**Calculation of concordance coefficient**

2 Assume that a number of experts (J experts in total) have been tasked to rank a number of accident scenarios (I scenarios), using the natural numbers (1, 2, 3, .. , I). Expert 'j' has thereby assigned rank $x_{ij}$ to scenario 'i'. The concordance coefficient 'W' may then be calculated by the following formula:

$$W = \frac{12 \sum_{i=1}^{i=I} \left[ \sum_{j=1}^{j=J} x_{ij} - \frac{1}{2} J(I+1) \right]^2}{J^2 \left( I^3 - I \right)}$$

3 The coefficient W varies from 0 to 1. W=0 indicates that there is no agreement between the experts as to how the scenarios are ranked. W=1 means that all experts rank scenarios equally by the given attribute.

**Examples**

4 The following three tables are examples. In each example there are 6 experts (J=6) that are ranking 10 scenarios (I=10). In order to show the role of the concordance coefficient, the final combination by $\sum x_{ij}$ constructed by the importance of hazards 1- 10 for all three groups. From tables 1 to 3 it is quite evident how various degrees of concordance have been formed.

5 Assessment of significance of the concordance coefficient is determined by parameter Z:

$$Z = \frac{1}{2} \ln \frac{(J-1)W}{1-W}$$

which has the Fischer distribution with degrees of freedom $\nu_1 = I - 1 - \frac{2}{J}$ and $\nu_2 = (J-1)\nu_1$. If I > 7 Pearson's criteria $\chi^2$ may be used. The value of $J(I-1)W$ has a $\chi^2$-distribution with $\nu = I - 1$ degrees of freedom.

**Table 1: Group of experts with high degree of agreement**

| Experts \ Hazards | 1* | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 3 | 4 | 2 | 5 | 6 | 8 | 10 | 7 | 9 |
| 2 | 2 | 3 | 1 | 5 | 4 | 6 | 7 | 8 | 9 | 10 |
| 3 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 4 | 2 | 1 | 4 | 3 | 6 | 5 | 7 | 8 | 10 | 9 |
| 5 | 2 | 3 | 1 | 4 | 5 | 6 | 8 | 10 | 9 | 7 |
| 6 | 1 | 2 | 4 | 3 | 5 | 7 | 6 | 8 | 9 | 10 |
| $\sum x_{ij}$ | 9 | 14 | 17 | 21 | 30 | 36 | 43 | 52 | 53 | 55 |

* Numbers correspond to the initial list of hazards.

Calculations based on Table 1 result in W = 0,909; $\chi^2 = J(I-1)W = 47{,}5$; confidence level of probability $\alpha = 0{,}999$.

**Table 2 Group of experts with medium degree of agreement**

| Experts \ Hazards | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 6 | 8 | 4 | 2 | 3 | 5 | 7 | 9 | 10 |
| 2 | 2 | 3 | 1 | 5 | 6 | 4 | 7 | 8 | 10 | 9 |
| 3 | 3 | 4 | 1 | 2 | 5 | 8 | 9 | 10 | 6 | 7 |
| 4 | 4 | 5 | 6 | 1 | 8 | 2 | 3 | 10 | 7 | 9 |
| 5 | 4 | 3 | 1 | 9 | 2 | 5 | 7 | 10 | 6 | 8 |
| 6 | 5 | 1 | 7 | 4 | 3 | 9 | 8 | 2 | 10 | 6 |
| $\sum x_{ij}$ | 19 | 23 | 24 | 25 | 26 | 31 | 39 | 47 | 48 | 49 |

Calculations based on the ranking in Table 2 result in W = 0,413; $\chi^2 = 25{,}4$; $\alpha = 0{,}995$, where $\alpha$ is the confidence level of probability.

**Table 3 Group of experts with low degree of agreement**

| Experts \ Hazards | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5 | 9 | 3 | 8 | 2 | 1 | 7 | 10 | 6 | 4 |
| 2 | 1 | 5 | 7 | 4 | 8 | 9 | 3 | 6 | 2 | 10 |
| 3 | 6 | 2 | 8 | 3 | 9 | 10 | 4 | 1 | 5 | 7 |
| 4 | 1 | 4 | 3 | 2 | 7 | 5 | 9 | 6 | 10 | 8 |
| 5 | 6 | 1 | 3 | 5 | 2 | 8 | 4 | 9 | 7 | 10 |
| 6 | 3 | 7 | 5 | 8 | 4 | 2 | 10 | 6 | 9 | 1 |
| $\sum x_{ij}$ | 22 | 28 | 29 | 30 | 32 | 35 | 37 | 38 | 39 | 40 |

Calculations based on the ranking in Table 3 result in W = 0,102; $\chi^2 = 5{,}4$; $\alpha = 0{,}20$.

6 The level of agreement is characterized in table 4:

| Table 4: Concordance Coefficients | | |
|---|---|---|
| **W** | > 0.7 | Good agreement |
| **W** | 0.5 – 0.7 | Medium agreement |
| **W** | < 0.5 | Poor agreement |

**Other use**

7 The method described can be used in all cases where a group of experts are asked to rank object according to one attribute using the natural numbers [1,I].

8 Generalizations of the method may be used when experts assign values to parameters, when pair comparison methods are used, etc. David (1969), Kendall (1970). An FSA application is published by Paliy et al. (2000).

**References for further reading**

1. David, H.A. The method of paired comparison. Griffin and Co, London, 1969.

2. Kendall, M. Rank correlation methods. Griffin and Co, London, 1970.

3. Paliy, O., E. Litonov, V.I. Evenko. Formal Safety Assessment for Marine Drilling Platforms. Proceedings Ice Tech' 2000, Saint Petersburg, 2000.

## Appendix 10

## GUIDANCE FOR PRACTICAL APPLICATION AND REVIEW PROCESS OF FSA

### INTRODUCTION

1 The Guidance provides information on the following subjects:

.1 project management issues to be considered for an FSA study;

.2 application of FSA by a Member State or an organization having a consultative status with the IMO (hereinafter called Member), when proposing amendments to maritime safety and pollution prevention instruments, to support or analyse the implications of such proposals;

.3 application of FSA by a Committee or instructed subsidiary body, to provide a balanced view of a framework of regulations, so as to identify priorities and areas of concern, and to analyse the benefits and implications of proposed changes;

.4 consideration of the expertise for the team carrying out an FSA study and qualifications for those experts; and

.5 review of an FSA study.

2 Recommendations resulting from an FSA study should aim to be used by decision makers at all levels and in a variety of contexts at the IMO, without a requirement of specialist expertise. For this purpose, an FSA study should be open and transparent for review by all interested Member States and non-governmental organizations which have not participated in the conduct of the FSA study.

3 FSA studies submitted to the Organization in accordance with the Guidelines for formal safety assessment (FSA), for use in IMO rule-making process for consideration, when introducing or amending IMO instruments should be considered as one source but not the only source of valuable information to support IMO decision-making.

### PRACTICE/CONDUCT OF FSA STUDY

### Project management

4 Any activity that uses resources to transform inputs to outputs can be considered a process, and this definition also fits FSA. Quality management in FSA can be applied by identifying each FSA step as a sub-process involving a number of interrelated activities, and by establishing means to facilitate, monitor and control these activities to achieve the desired objectives.

5 In principle, critical issues, controls and controlling measurements to monitor the quality of the process should be defined for each FSA step. Moreover, several issues should be identified up front, before the study initiation and periodically reviewed during the study:

.1 basic reasons to undertake the study;

.2 responsibilities and skills of the team in the various stages of the study;

.3 clear authority chart;

.4 extent of the coverage of the study (in particular, how many of the FSA steps are required, which tools are expected to be used);

.5 a project plan including the time scale of the study;

.6 potentially critical areas and key measures of quality assurance; and

.7 risk evaluation criteria.

**Application of FSA by a Member**

6 A Member Government or an organization having a consultative status with IMO, or a pool of Members, may decide to carry out an FSA and submit its results for consideration by a Committee or instructed subsidiary body. The scope of the FSA definition of the problem and its boundaries should be decided by the Member(s) conducting the study, in the context of the submitted proposal. The costs involved in carrying out the study should be covered by the Member(s) conducting the study, who will also coordinate and keep responsibility for the work of subcontractors, if any.

7 The Member(s) carrying out the FSA study should make its/their best efforts to ensure that the report is presented in accordance with the Standard Format for Reporting FSA Applications, given in appendix 8 of the FSA Guidelines. It is important that the FSA report includes the names and credentials of the experts who have carried out or have been involved in the FSA.

**Application of FSA by a Committee or an instructed sub-committee**

8 The Committee may decide to carry out an FSA study following:

.1 a proposal by a Member;

.2 a proposal from a subsidiary body; or

.3 discussion in the Committee of an agenda item.

9 There are different options which may be followed by the Committee for undertaking the FSA study. In some circumstances, for instance when a proposal has far reaching implications and requires a balanced view between all relevant issues, the Committee may decide that the FSA study should be carried out by an instructed Sub-Committee, as described in paragraphs 15 to 24 below.

10 Further options for undertaking an FSA study may also be appropriate, one of which could be to invite a Member, or a pool of Members, to carry out the FSA study and report its results for consideration by the Committee. The Member(s) accepting this proposal could proceed according to the steps given in paragraphs 4 to 9 above.

11 In cases where the Committee decides that the study should be carried out by instructed sub-committee(s), the FSA study may be conducted in accordance with the flow chart shown in figure 1, as described below.

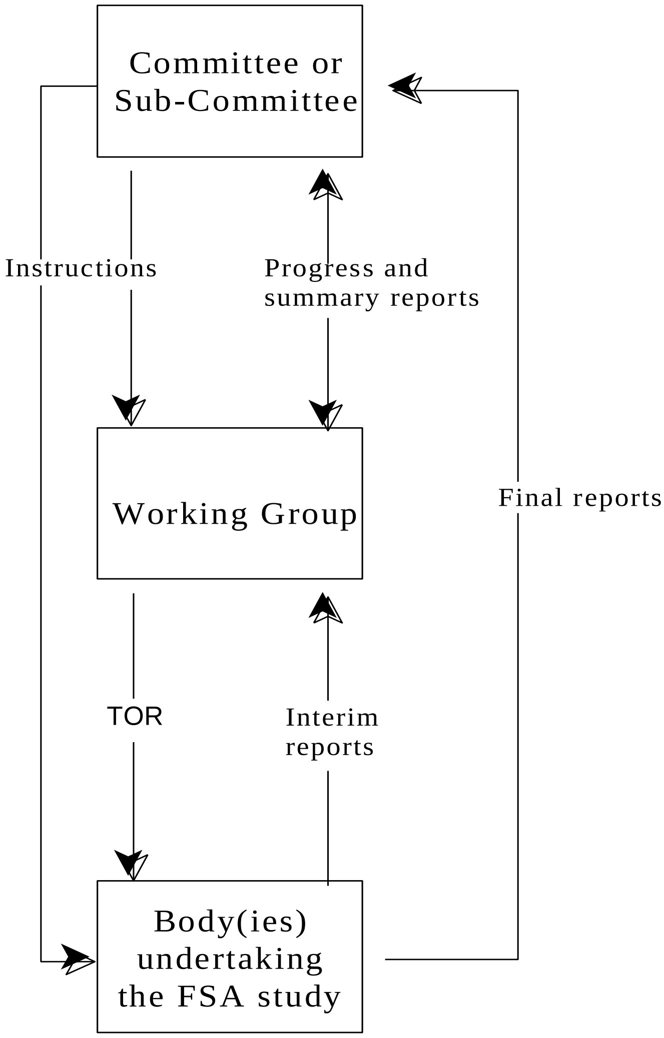



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**Figure 1**

12 The Committee may decide to establish a working group, instructed to:

.1 develop the terms of reference for undertaking FSA;

.2 propose a list of required competencies;

.3 develop and execute a project management plan;

.4 coordinate the conduct of FSA;

.5 validate FSA, when necessary; and

.6 report the results of FSA to the Committee, for information and approval.

13 The terms of reference of FSA may include, inter alia:

.1 the definition of the problem under consideration and its boundaries (chapter 4 of the Guidelines);

.2 characterization of the problem under consideration, for example in terms or features, characteristics and attributes which are relevant to the problem concerned (section 4.2 of the Guidelines);

.3 the organization and tasks proposed for carrying out the 5 steps of the FSA process, including instructions to the relevant subsidiary bodies; and

.4 the list of competencies required for carrying out each step of FSA.

14 The Committee should examine the draft terms of reference developed by the working group, including in particular the necessary competencies, for approval. On the basis of the approved terms of reference, the Committee will:

.1 instruct the sub-committee(s) to undertake FSA (for instance a sub-committee or several sub-committees);

.2 endorse the list of competencies for carrying out each step of FSA; and

.3 invite Members willing to participate in the conduct of the FSA study to provide persons with the required competencies.

15 Members interested in participating in FSA should provide the Committee with a list of persons proposed to participate in the sub-committees instructed to carry out the FSA study, together with details of their relevant competencies. The working group should determine that such a list, when completed, covers the competencies deemed necessary for carrying out each step of the FSA study, and report to the Committee to decide as appropriate.

16 Each instructed subsidiary body should carry out the parts of the FSA study assigned to them. Any progress reports that the Committee may require, and, on completion of the FSA study, the final report should be submitted to the Committee. This final report should be in accordance with the Standard Reporting Format, given in annex 2 of the FSA Guidelines.

17 Interim reports may be submitted to the working group for the purposes of providing inputs to other parts of the process and enabling the working group to facilitate and monitor progress according to the project plan. The working group should review these reports and inform the Committee whether the FSA study proceeds in accordance with the approved project management plan. The working group should also propose necessary corrective actions, if any.

18 In addition to the final report submitted to the Committee by the sub-committees undertaking the FSA study, the working group should, at the completion of the FSA study, present to the Committee a summary report, which may include, inter alia:

.1 an evaluation that the methodology applied is in accordance with the Interim Guidelines;

.2 any proposals for improvement of the Interim Guidelines;

.3 deviations, if any, from the terms of reference approved by the Committee, and reasons therefor; and

.4 a list of recommendations resulting from the FSA study for a decision by the Committee.

19 The Committee should receive the recommendations made by the working group and decide as appropriate.

**Participation of experts in an FSA study**

20 The participation of experts in the various fields is an essential part for the success of an FSA application. The team carrying out the FSA study should be selected in accordance with the area of interest of the study and related problems. A number of other experts should be involved to gather expert views and judgements throughout the five steps of the FSA process.

21 The team carrying out an FSA study should cover the fields of expertise necessary to progress within the five steps of the FSA process. The composition of the team depends on the type of problem and level of detail of the assessment. For instance, the team might include:

.1 experts in risk assessment techniques;

.2 experts in statistical data gathering and analysing;

.3 experts involved in casualty investigations;

.4 experts in the human element;

.5 experts in the applicable rules and regulations;

.6 experts from the technical, operational and organizational field, (e.g. designers, builders and operators);

.7 experts in consequence assessment (e.g. SAR, salvage and environment protection); and

.8 experts in cost-benefit assessment.

22 The team carrying out an FSA study may involve other experts in order to provide additional expert views, technical evaluations and/or judgements. All the experts involved in FSA study should have, as far as possible, a basic knowledge and understanding of the FSA methodology, as set out in the FSA Guidelines.

23 The experts to be involved should cover the widest possible range of knowledge, qualifications and competence relevant to the problem under consideration, including for instance:

.1 organizational and managerial aspects, e.g. pertinent to shipping companies;

.2 technical aspects, e.g. design, construction, operation and maintenance;

.3 legal, finance and insurance matters; and

.4 matters of concern to flag Administrations and port State controls.

24 The names and expertise of the members of the team carrying out an FSA study and other experts involved should be included in an annex to the report containing the results of the study.

25 Other experts in various fields may be involved when reviewing and discussing the results of the FSA study.

## REVIEW OF FSA STUDY

### *Review process*

26 The Committee or an instructed subsidiary body should consider the submission of an FSA study and decide, on a case by case basis, the most appropriate course of action. When the subject is sufficiently clear, the Committee can form an opinion about the FSA study and its relevant proposals, and decide accordingly. In other circumstances, the Committee may decide that a review is necessary to validate the FSA study and its findings.

27 The review process should be carried out within the Organization, by a group of experts established by the Committee for that purpose following the flow chart shown in figure 2 below.

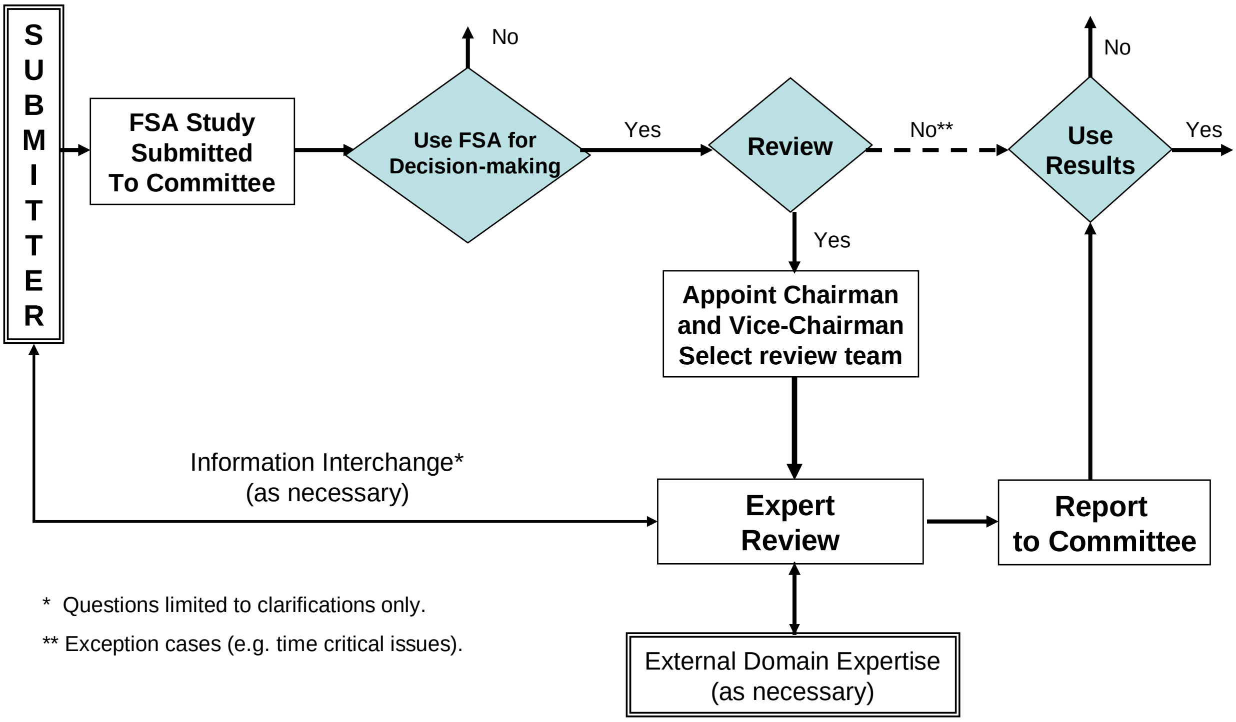



**Figure 2**

**Flow chart for FSA review process**

**Terms of reference of the Experts Group**

28 The terms of reference of such a review should be established by the Committee, based on the matter under consideration. The terms of reference should be to review the FSA studies submitted, in particular to:

.1 check

.1 the adequacy of scope of the FSA; and definition of the problem;

.2 the validity of the input data (transparency, comprehensiveness, availability, etc.);

.3 the adequacy of expertise of participants in the FSA; identified hazards and their ranking; and the reasonableness of assumptions;

.4 the adequacy of accident scenarios, risk models and calculated risks; identified RCMs and RCOs; selection of RCOs for Cost-Benefit Analysis (CBA); and CBA results;

.2 check methodologies used and relevance of methods and tools for:

.1 decision in the group(s) in the FSA;

.2 HAZID;

.3 Calculation of risk;

.4 Cost-Benefit Analysis (CBA);

.5 Sensitivity and uncertainty analysis;

.3 if any deficiency was identified in the items above, consider whether they affect the results;

.4 consider whether the FSA was conducted in accordance with the Guidelines;

.5 check whether the recommendations in the FSA ask to take any immediate action or propose any changes to IMO instruments;

.6 consider whether the results and the recommendations in the FSA are credible and advise the decision makers (e.g. Committees of the Organization) accordingly; and

.7 consider whether it is necessary to improve the FSA Guidelines, and, if so, the proposal for the improvement.

**Establishment of, and report from, the Experts Group**

29 When the Committee decides to establish a group of experts for a specific project, it should determine the number of meetings necessary to meet the target completion date.

30 The Members, having carried out the FSA study, should provide timely and open access to relevant supporting documents, and any reasonable opportunity to take into consideration the comments received.

31 The results of the review by the group of experts should be presented to the Committee or instructed subsidiary body, as appropriate. The group of experts should, as a goal, try to reach consensus on its conclusions for the review of the FSA study, but where there are strong conflicting views, these should be indicated in the report.

***Structure of the Experts Group***

32 Participation in a group of experts will be voluntary and is open to all Member Governments and international organizations.

33 A Chairman and a Vice-Chairman should be selected by the Committee when it decides an FSA study should be reviewed by a group of experts.

34 When nominating experts, Governments and international organizations should nominate experts who have suitable qualifications in the field of formal safety assessment, as described in paragraph 37, and inform the Organization of particulars of the expert (e.g. name, expertise and contact details) with a short CV.

35 Participants in the group of experts should:

.1 have not been involved in the FSA study to be reviewed; and

.2 be capable of acting scientifically independent (i.e. acting in an individual capacity).

36 The review work should be conducted concisely in order to give timely conclusion(s) to the Committee(s) and, in order to do so, the review work can be conducted by holding meetings of the group (without interpretation) as well as by correspondence.

***Qualifications of the experts***

37 Members participating in a group of experts should, as a minimum, have knowledge/training in the application of the FSA Guidelines, and should have, at least, one of the following qualifications:

.1 risk assessment experience;

.2 a maritime background; or

.3 relevant knowledge or any unique concerns related to the FSA (e.g. human element).

***Report of the Experts Group***

38 Experts Groups' reports should only include the names of the experts but not of the nominating Governments and organizations.

***

# ANNEX 35

## DRAFT MSC-MEPC CIRCULAR

## GUIDELINES FOR THE APPLICATION OF THE HUMAN ELEMENT ANALYSING PROCESS (HEAP) TO THE IMO RULE-MAKING PROCESS

1 The Maritime Safety Committee, at its sixty-ninth session (11 to 20 May 1998) and the Marine Environment Protection Committee, at its forty-second session (2 to 6 November 1998), approved the Interim Guidelines for the application of Human Element Analysing Process (HEAP) to the IMO rule-making process (MSC/Circ.878-MEPC/Circ.346).

2 The Maritime Safety Committee, at its seventy-fourth session (30 May to 8 June 2001), and the Marine Environment Protection Committee, at its forty-seventh session (4 to 8 March 2002), approved the Guidance on the use of human element analysing process (HEAP) and formal safety assessment (FSA) in the rule-making process of IMO (MSC/Circ.1022-MEPC/Circ.391).

3 The Maritime Safety Committee, at its ninety-first session (26 to 30 November 2012), and the Marine Environment Protection Committee, at its [sixty-fifth session (13 to 17 May 2013)], reviewed the aforementioned Interim Guidelines and Guidance in the light of the experience gained with their application and approved the Guidelines for the application of Human Element Analysing Process (HEAP) to the IMO rule-making process, as set out in the annex.

4 HEAP is a practical tool designed to address the human element, to be used for consideration of maritime safety and environmental protection issues at IMO. A flowchart is provided in the annex, in accordance with Assembly resolution A.850(20) on *Human Element Vision, Principles and Goals for the Organization*, goal (a) of which states: "to have in place a structured approach for the proper consideration of human element issues for use in the development of regulations and guidelines by all Committees and Sub-Committees". The steps outlined in the flow chart list a series of questions that should be considered to appropriately address the human element in the regulatory development process.

5 These Guidelines are intended to facilitate trial applications of HEAP and should remain in an interim state as long as it is necessary to gain experience. Such trial applications will lead to a greater understanding of HEAP by all parties and identify improvements to the process.

6 An example of the application of HEAP to the IMO rule-making process is attached as an appendix.

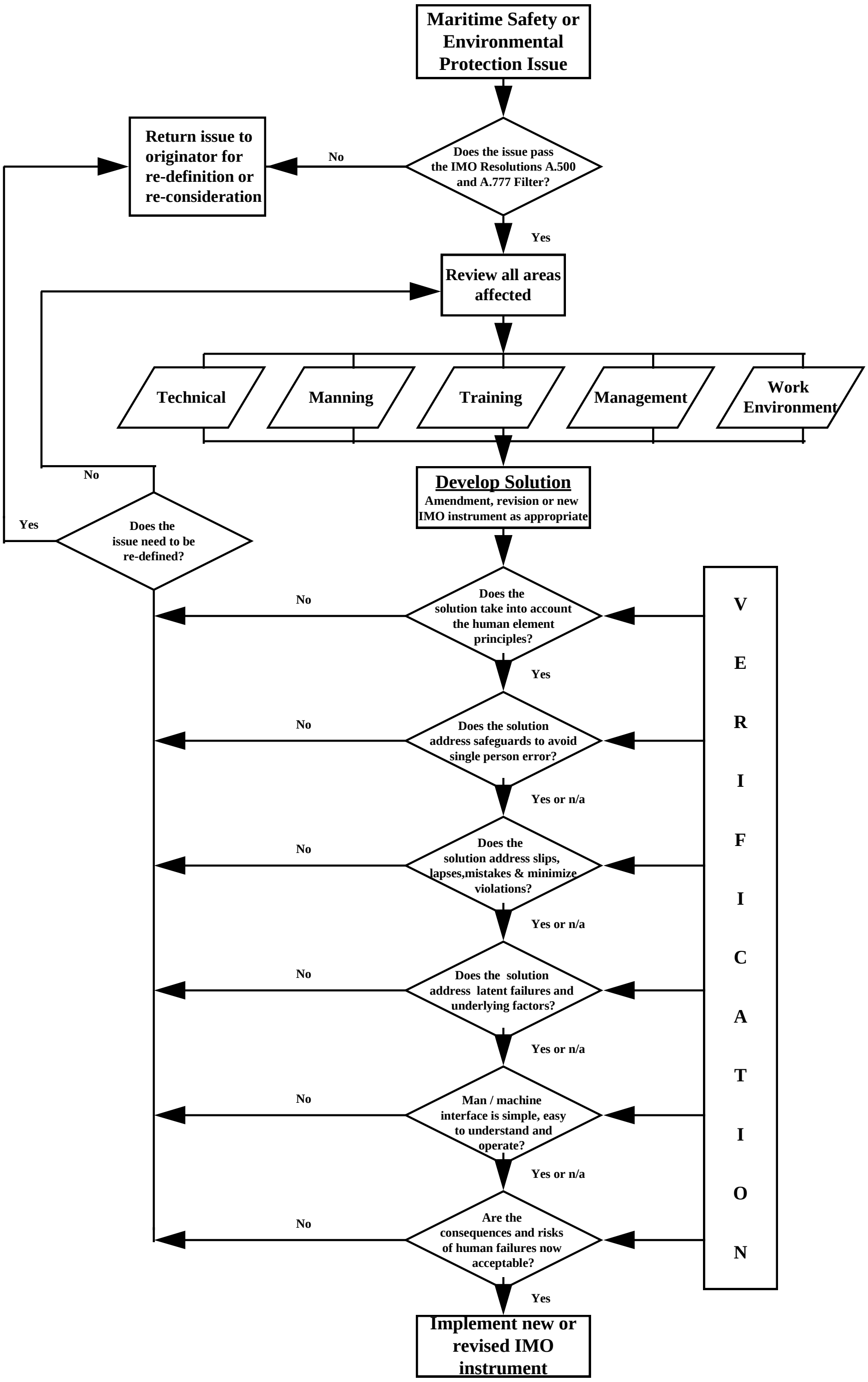
7 Member Governments and international organizations are invited to apply the Guidelines contained in this circular.

8 The Interim Guidelines, contained in MSC/Circ.878-MEPC/Circ.346, and the Guidance, contained in MSC/Circ.1022-–MEPC/Circ.391, as amended by MSC-MEPC.2/Circ.6, are superseded.

ANNEX

**GUIDELINES FOR THE APPLICATION OF HUMAN ELEMENT ANALYSING PROCESS (HEAP) TO THE IMO RULE-MAKING PROCESS REVISED GUIDANCE**

# Human Element Analysing Process Flowchart



## ASSOCIATED EXPLANATORY NOTES TO THE HEAP FLOW CHART

HEAP is a practical tool, designed to address the human element, to be used for consideration of maritime safety and environmental protection issues at IMO. The flowchart is provided in accordance with Assembly resolution A.850(20) on *Human Element Vision, Principles and Goals for the Organization*, goal (a) of which states: the aim "to have in place a structured approach for the proper consideration of human element issues for use in the development of regulations and guidelines by all Committees and Sub-Committees". The steps outlined in the flowchart list a series of questions that should be considered to appropriately address the human element in the regulatory development process. To assist in the proper application in the use of HEAP, the following general description is provided:

**Maritime Safety or Environmental Protection Issue**

### 1 Issue identification

The identification of a maritime safety or environmental protection issue is external to HEAP and can be accomplished through several methods, such as the review of existing IMO instruments, the review of casualties or the identification of other marine circumstances which may cause concern. The issue identification process should result in a clear, concise issue statement and a determination of the parameters containing who, what, where, how, when, to what extent and an appropriate description with supporting information.

**Does the issue pass the IMO Resolutions A.500 and A.777 Filter?**

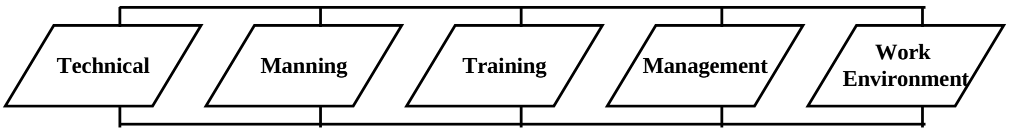
### 2 Is IMO action appropriate?

When seeking to resolve the identified issue, it must be decided whether or not it is appropriate for IMO to be involved and whether a solution developed by IMO is the only action which may be taken. In some cases, it may be more appropriate to refer the matter to another organization or group requesting that they develop a solution not requiring the development, or change to, IMO instruments.

**Review all areas affected**

### 3 Review all areas affected

If IMO action is appropriate, revisions to and application of existing IMO instruments should be the first consideration. Where the Organization determines the existing instruments or initiatives cannot be applied to resolve the issue, then development of a new IMO instrument(s) should be considered. As a first step to applying HEAP, it is important to ensure that if the proposal requires additional regulations in other areas such as technical, manning, education, management, or working environment, that these areas receive due consideration to ensure all aspects of the human element are fully covered.




## 4 Human element checklist

The following checklist is provided for use in verifying that the human element has been adequately considered. It consists of five subject areas that should be considered when using this tool. It must also be recognized that these lists are intended as a practical guide and are neither exhaustive nor necessarily applicable to all situations.

**Technical**
(The vessel and/or its equipment)

- Design
- Ergonomics
- Manufacture/construction
- Installation
- Initial and periodic testing
- Approval
- Maintenance
- Repairs
- Modifications
- Renewals
- Expected marine environment[1]
- Operations[2]

**Manning**
(Master and crew of the vessel)

- Qualifications
- Number of crew members
- Composition of crew
- Culture[3]
- Working Language
- Medical Conditions
- Competence

**Training**
(Ashore and aboard)

- Basic Safety Training
- Familiarization
- Drills
- Extended safety training
- Training of personnel ashore

**Management**
(Ashore and aboard)

- Policy
- Safety culture
- Motivation
- Communication links
- Responsibility
- Authority
- Work planning
- Contingency planning
- Emergency response
- Manuals
- Procedures
- Instructions
- Work methods
- Checklists
- Education and Training

**Work Environment/conditions**
(aboard ship)

- Hazardous materials
- Man-machine interface[4]
- Personnel protection
- Physical hazards
- Hours of work
- Hours of rest
- Fatigue
- Estimated workload[5]
- Actual marine environment
- Living conditions

1 Is interpreted to mean marine environment preconditions (e.g. sea state, air temperature).
2 There are some technical regulations which have an influence on operations (e.g. MARPOL regulation 26).
3 Is interpreted to mean personnel culture (e.g. multinational crew).
4 Is a technical issue which has implications on the work environment.
5 Workload including watchkeeping, cargo duty, maintenance, and possible breakdowns.

**Develop Solution**
**Amendment, revision or new IMO instrument as appropriate**

## 5 Develop necessary revisions or new instruments

After area identification has been completed, the necessary revisions should be undertaken with a focus on ensuring the human element principles have been taken into account.

**VERIFICATION**

## 6 Is the issue resolved?

Before accepting any solution to an issue, a process should be undertaken to verify that the safety concerns identified in the original safety issue were addressed. The following series of questions is designed to ensure the proposed solution takes into account the various aspects of the human element that contribute to unsafe acts and accidents. By determining the impact of the solution on the parameters who, what, where, how, when, and to what extent), the degree of success can be established and it can be determined if the issue has been resolved, in part, or not resolved.

**Does the solution take into account the human element principles?**

## 7 Human element principles (Assembly resolution A.850(20))

Any proposed solution must take into account the human element principles adopted by the Organization:

- The human element is a complex multidimensional issue that affects maritime safety and marine environmental protection. It involves the entire spectrum of human activities performed by ship's crews, shore-based management, regulatory bodies, recognized organizations, shipyards, legislators and other relevant parties and they need to cooperate to address human element issues effectively.

- The Organization, when developing regulations, should honour the seafarer by seeking and respecting the opinions of those that do the work at sea.

- Effective remedial action following maritime casualties requires a sound understanding of human element involvement in accident causation. This comes by the thorough investigation and systematic analysis of casualties for contributory factors and the causal chain of events.

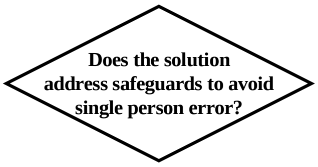
- In the process of developing regulations, it should be recognized that adequate safeguards must be in place to ensure that a single person error will not cause an accident through the application of these regulations.

- Rules and regulations addressing the seafarers directly should be simple, clear and comprehensive.

- Crew performance is a function of individual capabilities, management policies, cultural factors, experience, training, job skills, work environment and countless other factors.

- Dissemination of information through effective communication is essential to sound management and operational decisions.

- Consideration of human element matters should aim at decreasing the possibility of human error as far as possible.




## 8 Single person error

A single person error must not lead to an accident. The situation must be such that errors can be corrected or their effect minimized. Corrections can be carried out by equipment, individuals or others. This involves ensuring that the proposed solution does not rely solely on the performance of a single individual. An example is a pilot conning a ship without any support from the master or officer of the watch.


## 9 Slips, lapses, mistakes & violations

Slips are errors relating to the execution of day to day tasks where there has been inattention or over attention. Lapses are similar to slips where forgetfulness or absentmindedness cause errors. Mistakes may result from errors of judgement, calculation or interpretation of information. Violations involve the deliberate breach of accepted practices and procedures, guidelines, operating instructions, or regulations. Violations may be the result of taking short cuts to save time or effort. Although inherently unsafe, such practices may become institutionalized and increase the risk threshold and the probability of an accident. Violations may be the result of poorly written guidelines or regulations and the failure of management to effectively audit practices and procedures on board vessels.

**Does the solution address latent failures or underlaying factors?**

## 10 Latent failures or underlying factors

Latent failures or underlying factors relate to pre-existing conditions that may exist within systems or organizations, which given the right combination of circumstances, may contribute to an unsafe situation. They include such conditions as, organizational, design, maintenance, communication failures, etc.

**Man / machine interface is simple, easy to understand and operate?**

## 11 Man/Machine Interface

Involves the compatibility of ship design and equipment design with the individuals that work on a ship or use the equipment. The man/machine interface includes issues such as human input aspects, easily understood information display and the interaction between the human operator and the 'machine'. The aim is to achieve uniform design and layout, to use internationally recognized symbols on equipment controls, using established ergonomic principles, criteria and requirements, combined with appropriate education and training.

**Are the consequences and risks of human failures now acceptable?**

## 12 Consequences and risks

The final step in the process is to make sure that the consequences of human failure have been addressed, and that the Organization will accept any remaining consequences/risks. If not, the Organization should re-evaluate the proposed solutions until an acceptable solution is reached.

**Implement new or revised IMO instrument**

## Appendix

## AN EXAMPLE OF UTILIZING HEAP IN THE IMO RULE-MAKING PROCESS

1 The Sub-Committee on Fire Protection, while undertaking a comprehensive review of SOLAS chapter II-2, used HEAP for determining the contents of regulations II-2/14 "Operational readiness and maintenance", II-2/15 "Instructions, onboard training and drills" and II-2/16 "Operations" and found that HEAP was a useful tool to identify areas which should be taken into account concerning operation and maintenance of fire safety systems and fire drills.

2 HEAP was used within the correspondence group on the comprehensive review of SOLAS chapter II-2.

3 Regulations 4 to 13 of SOLAS chapter II-2 require fire safety construction, arrangement and equipment on board ships, based upon the following:

.1 prevention of fire;

.2 detection of fire;

.3 suppression and control of fire; and

.4 escape from fire.

Then these regulations were screened using HEAP to determine which actions were to be taken by crew and management. Through the process set out in paragraph 4 of the annex (Human element Checklist), details of the following measures relating to fire safety construction, arrangement and equipment were identified:

.1 operational readiness;

.2 maintenance;

.3 instructions; and

.4 training and drills on board.

4 The results were reviewed in the correspondence group and taken into consideration when drafting regulations 14, 15 and 16 of SOLAS chapter II-2.

5 The Sub-Committee reviewed and endorsed the outcome.

***

# ANNEX 36

## BIENNIAL AGENDAS OF THE SUB-COMMITTEES

| **BULK LIQUIDS AND GASES (BLG)** | | | | | |
|---|---|---|---|---|---|
| **PLANNED OUTPUTS 2012-2013** | | | | | |
| **Number** | **Description** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Target completion year** |
| 1.1.2.2 | Consideration of IACS unified interpretations | MSC / MEPC | | BLG / DE / FP / FSI / NAV / SLF | Continuous |
| 2.0.1.8 | Additional guidelines for implementation of the BWM Convention, including port State control | MEPC | BLG / FSI | | 2013 |
| 2.0.1.9 | Guidelines for replacement engines not required to meet the Tier III limit (MARPOL Annex VI) | MEPC | BLG | | 2013 |
| 2.0.1.11 | Other relevant guidelines pertaining to equivalents set forth in regulation 4 of MARPOL Annex VI and not covered by other guidelines | MEPC | BLG | | 2013 |
| 2.0.1.12 | Guidelines called for under paragraph 2.2.5.6 of the $NO_x$ Technical Code | MEPC | BLG | | 2013 |
| 5.2.1.3 | Development of international code of safety for ships using gases or other low flashpoint fuels | MSC | BLG | DE / FP | 2013 |
| 5.2.1.4 | Development and approval of a revised IGC Code | MSC | BLG | DE / FP / SLF / STW | 2013 |
| 7.1.2.5 | Production of a manual entitled "Ballast Water Management – How to do it" | MEPC | BLG | | Continuous |
| 7.1.2.15 | Development of a Code for the transport and handling of limited amounts of hazardous and noxious liquid substances in bulk on offshore support vessels | MSC / MEPC | BLG | DE | 2013 |
| 7.1.2.20 (UO) | Development of international measures for minimizing the transfer of invasive aquatic species through biofouling of ships | MSC / MEPC | BLG | DE | 2013 |

| Number | Description | Parent organ(s) | Coordinating organ(s) | Associated organ(s) | Target completion year |
|---|---|---|---|---|---|
| 7.2.2.3 | Evaluation of safety and pollution hazards of chemicals and preparation of consequential amendments | MEPC | BLG | | Continuous |
| 7.3.1.1 | Review of relevant non-mandatory instruments as a consequence of the amended MARPOL Annex VI and the NOx Technical Code | MEPC | BLG | | 2013 |
| 7.3.2.2 | Consideration of the impact on the Arctic of emissions of Black Carbon from international shipping | MEPC | BLG | | 2013 |
| 12.1.2.1 | Casualty analysis | MSC | FSI | BLG / FP / NAV / STW | Continuous |
| 13.0.3.1 | Improved and new technologies approved for ballast water management systems and reduction of atmospheric pollution | MEPC | BLG | | Annual |

| CARRIAGE OF DANGEROUS GOODS, SOLID CARGOES AND CONTAINERS (DSC) | | | | | |
|---|---|---|---|---|---|
| **PLANNED OUTPUTS 2012-2013** | | | | | |
| **Number** | **Description** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Target completion year** |
| 5.2.1.7 | Review of general cargo ship safety | MSC | DE / DSC / FP / NAV / SLF / STW | | 2013 |
| 5.2.3.1 | Development of amendments to CSC 1972 and associated circulars | MSC | DSC | | 2013 |
| 5.2.3.2 | Development of measures to prevent loss of containers | MSC | DSC | DE / SLF / STW | 2013 |
| 5.2.3.3 | Development of amendments to the IMSBC Code, including evaluation of properties of solid bulk cargoes | MSC / MEPC | DSC | | Continuous |
| 5.2.3.4 | Development of amendments to the IMDG Code and supplements | MSC | DSC | | Continuous |
| 5.2.3.5 | Harmonization of the IMDG Code with the UN Recommendations on the Transport of Dangerous Goods | MSC | DSC | | Continuous |
| 5.2.3.8 | Amendments to MARPOL Annex III, as required | MEPC | DSC | | Continuous |
| 5.2.3.9 | Revised guidelines for packing of cargo transport units | MSC | DSC | | 2013 |
| 5.2.3.12 (UO) | Development of amendments to SOLAS and the relevant codes concerning mandatory carriage of appropriate atmosphere testing instruments on board ships | MSC | DSC | BLG / FP / STW | 2013 |
| 12.3.1.3 | Casualty and incident reports and analysis | MSC / MEPC | DSC | FSI | Continuous |

| FIRE PROTECTION (FP) | | | | | |
|---|---|---|---|---|---|
| **PLANNED OUTPUTS 2012-2013** | | | | | |
| **Number** | **Description** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Target completion year** |
| 1.1.2.2 | Consideration of IACS unified interpretations | MSC / MEPC | | BLG / DE / FP / FSI / NAV / SLF | Continuous |
| 2.0.1.23 | Development of unified interpretations for chapter 7 of the 2000 HSC Code | MSC | FP | | 2013 |
| 5.1.1.3 | Review of the recommendations on evacuation analysis for new and existing passenger ships | MSC | FP | | 2013 |
| 5.2.1.2 | Amendments to SOLAS related to the fire resistance of ventilation ducts | MSC | FP | | 2013 |
| 5.2.1.3 | Development of international code of safety for ships using gases or other low flashpoint fuels | MSC | BLG | DE / FP | 2013 |
| 5.2.1.6 | Development of requirements for additional means of escape from machinery spaces. | MSC | FP | | 2013 |
| 5.2.1.7 | Review of general cargo ship safety | MSC | DSC | DE / FP / FSI / NAV / SLF / STW | 2013 |
| 5.2.1.8 | Harmonized requirements for the location of entrances, air inlets and openings in the superstructures of tankers | MSC | FP | BLG | 2013 |
| 5.2.1.9 | Review of fire protection requirements for on-deck cargo areas | MSC | FP | DSC | 2013 |
| 5.2.1.10 | Development of requirements for ships carrying hydrogen and compressed natural gas vehicles | MSC | FP | | 2013 |
| 5.2.1.17 | Development of a mandatory Code of ships operating in polar waters | MSC / MEPC | DE | COMSAR / FP / NAV / SLF / STW | 2014 |
| 5.2.1.23 | Development of guidelines for use of Fibre Reinforced Plastic (FRP) within ship structures | MSC | FP | DE | 2013 |

| Number | Description | Parent organ(s) | Coordinating organ(s) | Associated organ(s) | Target completion year |
|---|---|---|---|---|---|
| 5.2.1.29 (UO) | Development of amendments to SOLAS chapter II 2, the FTP Code and MSC/Circ.1120 to clarify the requirements for plastic pipes on ships | MSC | FP | | 2013 |
| 5.2.1.30 (UO) | Development of amendments to the requirements for foam-type fire extinguishers in SOLAS regulation II 2/10.5 | MSC | FP | | 2013 |
| 5.2.1.32 (UO) | Development of an interpretation of SOLAS regulation II-1/13.6 on means of escape from ro-ro cargo spaces | MSC | FP | | 2013 |
| 5.2.1.34 (UO) | Consideration of amendments to SOLAS chapter II-2 on location of EEBDs | MSC | FP | | 2013 |
| 5.2.1.35 (UO) | Development of amendments to SOLAS regulation II-2/20 and associated guidance on air quality management for ventilation of closed vehicle spaces, closed ro-ro and special category spaces | MSC | FP | | 2013 |
| 5.2.3.10 | Measures to prevent fires and explosions on chemical tankers and product tankers under 20,000 deadweight tonnes operating without inert gas systems | MSC | FP | BLG / DE | 2013 |
| 12.1.2.1 | Analysis of fire casualty records | MSC | FSI | BLG / FP / NAV / STW | Continuous |

| FLAG STATE IMPLEMENTATION (FSI) | | | | | |
|---|---|---|---|---|---|
| **PLANNED OUTPUTS 2012-2013** | | | | | |
| **Number** | **Description** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Target completion year** |
| 1.1.2.1 | Preparation and holding of the third meeting of the Joint IMO/FAO Working Group on IUU fishing and related matters, including the adoption of a new treaty to facilitate the implementation of the technical provisions to the 1993 Torremolinos Protocol | MSC / MEPC | FSI / SLF | | 2013 |
| 1.1.2.2 | Consideration of IACS unified interpretations | MSC / MEPC | | BLG / DE / FP / FSI / NAV / SLF | Continuous |
| 1.1.2.5 | Development of PSC guidelines on seafarers' hours of rest taking into account the Maritime Labour Convention, 2006 | MSC | FSI | | 2013 |
| 1.1.2.23 | Policy input/guidance to ILO: development of PSC guidelines in the context of the Maritime Labour Convention, 2006 | MSC | FSI | | Continuous |
| 1.1.2.24 | Preparation and holding of the third meeting of the Joint FAO/IMO ad hoc Working Group on IUU Fishing and Related Matters (JWG) | MSC | FSI | SLF | 2013 |
| 1.1.2.26 | Policy input/guidance to PSC regimes: related IMO developments | MSC / MEPC | FSI | | Continuous |
| 2.0.1.8 | Additional guidelines for implementation of the BWM Convention, including port State control | MEPC | BLG / FSI | | 2013 |
| 2.0.1.13 | Development of a Code for Recognized Organizations | MSC / MEPC | FSI | | 2013 |
| 2.0.1.19 | Comprehensive review of issues related to the responsibilities of Governments and development of measures to encourage flag State compliance | MSC / MEPC | | FSI | Continuous |
| 2.0.1.21 | Summary reports and analyses of mandatory reports under MARPOL | MEPC | Secretariat | FSI | Continuous |

| Number | Description | Parent organ(s) | Coordinating organ(s) | Associated organ(s) | Target completion year |
|---|---|---|---|---|---|
| 2.0.2.1 | Review of the Code for the Implementation of Mandatory IMO Instruments and consolidated audit summary reports, adoption of the new IMO Instruments Implementation (III) Code and making the III Code and auditing mandatory | Assembly | Council | MSC / MEPC / FSI | 2013 |
| 4.0.2.2 | Development and management of mandatory IMO number schemes | MSC | FSI | Secretariat | Continuous |
| 4.0.2.3 | Protocols on data exchange with other international, regional and national data providers | MSC / MEPC / FAL / LEG / TCC | FSI | Secretariat | Continuous |
| 5.1.2.1 | Making the provisions of MSC.1/Circ.1206/Rev.1 mandatory | MSC | DE | FSI / NAV / STW | 2013 |
| 5.1.2.2 | Development of measures to protect the safety of persons rescued at sea | MSC / FAL | COMSAR | FSI | 2013 |
| 5.2.1.7 | Review of general cargo ship safety | MSC | FSI | DE / DSC / FP / NAV / SLF / STW | |
| 5.2.1.18 | Development of a non-mandatory instrument on regulations for non-convention ships | MSC | FSI | | 2013 |
| 5.2.1.19 | Review and update of the Survey Guidelines under the Harmonized System of Survey and Certification and the annexes to the Code for the Implementation of Mandatory IMO Instruments | MSC / MEPC | FSI | | 2013 |
| 5.3.1.2 | Review of procedures for PSC | MSC / MEPC | FSI | | 2013 |
| 5.3.1.4 | Promote the harmonization of PSC activities | MSC / MEPC | FSI | | Continuous |
| 5.3.1.5 | Methodology for the in-depth analysis of annual PSC reports | MSC / MEPC | FSI | | 2013 |
| 5.3.1.6 | A risk assessment comparison between marine casualties and incidents and PSC inspections | MSC / MEPC | FSI | | Continuous |
| 7.1.2.6 | Measures to promote the AFS Convention | MEPC | | FSI | 2013 |

| Number | Description | Parent organ(s) | Coordinating organ(s) | Associated organ(s) | Target completion year |
|---|---|---|---|---|---|
| 7.1.3.1 | Reports on inadequacy of port reception facilities | MEPC | FSI | | Annual |
| 7.1.3.2 | Follow-up to the implementation of the Action Plan on port reception facilities | MEPC | FSI | | 2013 |
| 12.1.2.1 | Collection and analysis of casualty and PSC data to identify trends and develop knowledge and risk-based recommendations | MSC | FSI | BLG / FP / NAV / STW | Continuous |
| 12.3.1.1 | Guidance on the development of GISIS and on access to information | MSC / MEPC | FSI | | Continuous |
| 12.3.1.2 | PSC data collected and disseminated in cooperation with PSC regimes | MSC | FSI | | Annual |
| 13.0.2.1 | Guidance for the Secretariat on the development of GISIS and on access to information | MEPC | FSI | | Continuous |

| RADIO-COMMUNICATIONS AND SEARCH AND RESCUE (COMSAR) | | | | | |
|---|---|---|---|---|---|
| **PLANNED OUTPUTS 2012-2013** | | | | | |
| **Number** | **Description** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Target completion year** |
| 1.1.2.10 | Cooperation with ICAO: annual meeting of the Joint ICAO/IMO Working Group on the Harmonization of Aeronautical and Maritime Search and Rescue (monitoring of SAR developments, continuous review of the IAMSAR Manual and developing recommendations) | MSC | COMSAR | DE | Continuous |
| 1.1.2.12 | Cooperation with ITU: consideration of matters related to the Radiocommunication ITU R Study Group and ITU World Radiocommunication Conference | MSC | COMSAR | NAV | Continuous |
| 1.1.2.16 | Liaison statements to/from IEC: radiocommunications and safety of navigation | MSC | COMSAR | NAV | Continuous |
| 1.1.2.19 | Liaison statements to/from ITU: radiocommunications | MSC | COMSAR | NAV | Continuous |
| 1.1.2.20 | Liaison statements to/from UNHCR: persons rescued at sea | MSC / FAL | COMSAR | NAV | Continuous |
| 1.3.5.2 | Development of amendments to the IAMSAR Manual | MSC | COMSAR | | Continuous |
| 2.0.3.1 | Technical guidance for the establishment of regional MRCCs and MRSCs in Africa, supported by the ISAR Fund | MSC | Secretariat | COMSAR | Continuous |
| 2.0.3.2 | Further development of the Global SAR Plan for the provision of maritime SAR services, including procedures for routeing distress information in the GMDSS | MSC | COMSAR | | Continuous |
| 2.0.3.4 | Reports on the Cospas-Sarsat System monitored and the list of IMO documents and publications which should be held by MRCCs updated | MSC | Secretariat | COMSAR | Continuous |
| 2.0.3.5 | Development of guidelines on harmonized aeronautical and maritime search and rescue procedures, including SAR training matters | MSC | COMSAR | | 2013 |

| Number | Description | Parent organ(s) | Coordinating organ(s) | Associated organ(s) | Target completion year |
|---|---|---|---|---|---|
| 5.1.2.2 | Development of measures to protect the safety of persons rescued at sea | MSC / FAL | COMSAR | FSI | 2013 |
| 5.2.1.17 | Development of a mandatory Code of ships operating in polar waters | MSC / MEPC | DE | COMSAR / FP / NAV / SLF / STW | 2014 |
| 5.2.4.2 | Revision of the Recommendation for the protection of the AIS VHF Data Link (resolution MSC.140(76)) | MSC | COMSAR | | 2013 |
| 5.2.4.4 | Implementation of LRIT system | MSC | COMSAR | | Continuous |
| 5.2.4.6 | Consideration of LRIT matters | MSC | COMSAR | | Continuous |
| 5.2.4.13 (UO) | Revision of the Guidelines for the on board operational use of shipborne automatic identification systems (AIS) | MSC | NAV | COMSAR | 2013 |
| 5.2.5.1 | Consideration of operational and technical coordination provisions of maritime safety information (MSI) services, including development and review of related documents | MSC | COMSAR | | Continuous |
| 5.2.5.2 | Development of measures to avoid false distress alerts | MSC | COMSAR | | 2013 |
| 5.2.5.3 | Further development of the GMDSS master plan on shore-based facilities | MSC | COMSAR | | Continuous |
| 5.2.5.4 | Consideration of developments in Inmarsat and Copsas-Sarsat | MSC | COMSAR | | Continuous |
| 5.2.5.5 | Developments in maritime radiocommunication systems and technology | MSC | COMSAR | | 2013 |
| 5.2.5.6 | Scoping exercise to establish the need for a review of the elements and procedures of the GMDSS | MSC | COMSAR | | 2012 |
| 5.2.5.7 (UO) | Draft High-level review completed and First outline of the detailed review of the Global Maritime Distress and Safety System (GMDSS) | MSC | COMSAR | NAV / STW | 2013 |
| 5.2.6.1 | Development of an e navigation strategy implementation plan | MSC | NAV | COMSAR / STW | 2013 |

| SAFETY OF NAVIGATION (NAV) | | | | | |
|---|---|---|---|---|---|
| **PLANNED OUTPUTS 2012-2013** | | | | | |
| **Number** | **Description** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Target completion year** |
| 1.1.2.2 | Consideration of IACS unified interpretations | MSC / MEPC | | BLG / DE / FP / FSI / NAV / SLF | Continuous |
| 1.1.2.7 | Cooperation with IHO: hydrographic issues | MSC | NAV | | Continuous |
| 1.1.2.12 | Cooperation with ITU: consideration of matters related to the Radiocommunication ITU R Study Group and ITU World Radiocommunication Conference | MSC | COMSAR / NAV | | Continuous |
| 1.1.2.15 | Liaison statements to/from IALA: VTS, aids to navigation, e-navigation and AIS matters | MSC | NAV | | Continuous |
| 1.1.2.16 | Liaison statements to/from IEC: radiocommunications and safety of navigation | MSC | COMSAR | NAV | Continuous |
| 1.1.2.17 | Liaison statements to/from IHO: hydrographic matters and promotion of ENCs covering various parts of the globe | MSC | NAV | | Continuous |
| 1.1.2.19 | Liaison statements to/from ITU: radiocommunications | MSC | COMSAR / NAV | | Continuous |
| 1.1.2.20 | Liaison statements to/from UNHCR: persons rescued at sea | MSC / FAL | COMSAR | NAV | Continuous |
| 1.1.2.21 | Liaison statements to/from WMO: meteorological issues | MSC | NAV | | Continuous |
| 1.3.1.3 | Identification of PSSAs, taking into account article 211 and other related articles of UNCLOS | MEPC | NAV | | Continuous |
| 5.1.2.1 | Making the provisions of MSC.1/Circ.1206/Rev.1 mandatory | MSC | DE | FSI / NAV / STW | 2013 |
| 5.2.1.7 | Review of general cargo ship safety | MSC | DE / DSC / FP / NAV / SLF / STW | | 2013 |
| 5.2.1.17 | Development of a mandatory Code of ships operating in polar waters | MSC / MEPC | DE | COMSAR / FP / NAV / SLF / STW | 2014 |

| Number | Description | Parent organ(s) | Coordinating organ(s) | Associated organ(s) | Target completion year |
|---|---|---|---|---|---|
| 5.2.4.1 | New routeing measures and mandatory ship reporting systems, including associated protective measures for PSSAs | MSC | NAV | | Continuous |
| 5.2.4.8 | Development of policy and new symbols for AIS Aids to Navigation | MSC | NAV | | 2013 |
| 5.2.4.11 (UO) | Revision of the information contained in the existing annexes to the Recommendation on the use of adequately qualified deep sea pilots in the North Sea, English Channel and Skagerrak (resolution A.486(XII)) | MSC | NAV | | 2013 |
| 5.2.4.12 (UO) | Revision of the information contained in the existing annexes to the Recommendation on the use of adequately qualified deep-sea pilots in the Baltic (resolution A.480(XII)) | MSC | NAV | | 2013 |
| 5.2.4.13 (UO) | Revision of the Guidelines for the on board operational use of shipborne automatic identification systems (AIS) | MSC | NAV | COMSAR | 2013 |
| 5.2.4.14 (UO) | Consolidation of ECDIS-related IMO circulars | MSC | NAV | | 2014 |
| 5.2.4.15 (UO) | Development of explanatory footnotes to SOLAS regulations V/15, V/18, V/19 and V/27 | MSC | NAV | | 2014 |
| 5.2.4.16 (UO) | Application of the satellite navigation system "BeiDou" in the maritime field | MSC | NAV | | 2014 |
| 5.2.4.17 (UO) | Consideration of ECDIS matters related to the implementation of the carriage requirements in SOLAS regulations V/19.2.10 and V/19.2.11 | MSC | NAV | | 2014 |
| 5.2.5.7 (UO) | Draft High-level review completed and First outline of the detailed review of the Global Maritime Distress and Safety System (GMDSS) | MSC | COMSAR | NAV / STW | 2013 |

| Number | Description | Parent organ(s) | Coordinating organ(s) | Associated organ(s) | Target completion year |
|---|---|---|---|---|---|
| 5.2.6.1 | Development of an e navigation strategy implementation plan | MSC | NAV | COMSAR / STW | 2013 |
| 7.1.2.2 | Designation of Special Areas and PSSAs and adoption of their associated protective measures | MEPC | NAV | | Continuous |
| 7.2.1.1 | Bi-annual MSC circulars on designation of maritime assistance services (MAS) | MSC | NAV | | Annual |
| 12.1.2.1 | Casualty analysis | MSC | FSI | BLG / FP / NAV / STW | Continuous |

| SHIP DESIGN AND EQUIPMENT (DE) | | | | | |
|---|---|---|---|---|---|
| **PLANNED OUTPUTS 2012-2013** | | | | | |
| **Number** | **Description** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Target completion year** |
| 1.1.2.2 | Consideration of IACS unified interpretations | MSC / MEPC | | BLG / DE / FP / FSI / NAV / SLF | Continuous |
| 1.1.2.3 | Development of amendments to the 2011 ESP Code | MSC | DE | | Continuous |
| 1.1.2.11 | Review of provisions for helicopters in SOLAS | MSC | DE | | Continuous |
| 2.0.1.10 | Revision of the standard specification for shipboard incinerators (resolution MEPC.76(40)) | MEPC | DE | | 2013 |
| 2.0.1.24 | Mandatory instruments: development of amendments to SOLAS regulation II-1/40.2 concerning general requirements on electrical installations | MSC | DE | | 2013 |
| 5.1.2.1 | Making the provisions of MSC.1/Circ.1206/Rev.1 mandatory | MSC | DE | FSI / NAV / STW | 2013 |
| 5.1.2.3 | Development of a new framework of requirements for life-saving appliances | MSC | DE | | 2013 |
| 5.2.1.7 | Review of general cargo ship safety | MSC | DE / DSC / FP / NAV / SLF / STW | | 2013 |
| 5.2.1.11 | Development of safety objectives and functional requirements of the Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III | MSC | DE | | 2013 |
| 5.2.1.12 | Development of amendments to the LSA Code for thermal performance of immersion suits | MSC | DE | | 2013 |
| 5.2.1.13 | Development of amendments to the LSA Code for free-fall lifeboats with float-free capabilities | MSC | DE | | 2013 |
| 5.2.1.17 | Development of a mandatory Code of ships operating in polar waters | MSC / MEPC | DE | COMSAR / FP / NAV / SLF / STW | 2014 |

| Number | Description | Parent organ(s) | Coordinating organ(s) | Associated organ(s) | Target completion year |
|---|---|---|---|---|---|
| 5.2.1.21 | Classification of offshore industry vessels and consideration of the need for a non-mandatory code for offshore construction support vessels | MSC | DE | | 2013 |
| 5.2.1.23 | Development of guidelines for use of Fibre Reinforced Plastic (FRP) within ship structures | MSC | FP | DE | 2013 |
| 5.2.1.24 | Revision of testing requirements for lifejacket RTDs in resolution MSC.81(70) | MSC | DE | | 2013 |
| 5.2.1.25 | Development of guidelines for wing-in-ground craft | MSC | DE | COMSAR / FP / NAV / SLF / STW | 2013 |
| 5.2.1.27 | Revision of the Recommendation on conditions for the approval of servicing stations for inflatable liferafts (resolution A.761(18)) | MSC | DE | | 2013 |
| 5.2.1.28 | Amendments to SOLAS regulation II-1/11 and development of associated Guidelines to ensure the adequacy of testing arrangements for watertight compartments | MSC | DE | | 2013 |
| 5.2.1.31 (UO) | Development of requirements for onboard lifting appliances and winches | MSC | DE | | 2014 |
| 5.2.1.33 (UO) | Development of amendments to SOLAS regulations II 1/29.3.2 and 29.4.2 clarifying the requirements for steering gear trials | MSC | DE | | 2013 |
| 12.1.2.1 | Casualty analysis | MSC | FSI | BLG / FP/ NAV / DE / SWT | Continuous |

| STABILITY AND LOAD LINES AND FISHING VESSELS SAFETY (SLF) | | | | | |
|---|---|---|---|---|---|
| **PLANNED OUTPUTS 2012-2013** | | | | | |
| **Number** | **Description** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Target completion year** |
| 1.1.2.2 | Consideration of IACS unified interpretations | MSC / MEPC | | BLG / DE / FP / FSI / NAV / SLF | Continuous |
| 2.0.1.5 | Development of provisions to ensure the integrity and uniform implementation of the 1969 TM Convention | MSC | SLF | DE / STW | 2013 |
| 2.0.1.25 (UO) | Development of mandatory carriage requirements for stability instruments on board tankers | MSC | SLF | | 2013 |
| 5.1.1.1 | Development of guidelines on safe return to port for passenger ships | MSC | SLF | | 2013 |
| 5.1.1.2 | Review of damage stability regulations for ro-ro passenger ships | MSC | SLF | | 2013 |
| 5.2.1.1 | Development of amendments to the criterion for maximum angle of heel in turns of the 2008 IS Code | MSC | SLF | | 2013 |
| 5.2.1.14 | Development of second generation intact stability criteria | MSC | SLF | | 2013 |
| 5.2.1.15 | Revision of SOLAS chapter II 1 subdivision and damage stability regulations | MSC | SLF | | 2012 |
| 5.2.1.17 | Development of a mandatory Code of ships operating in polar waters | MSC / MEPC | DE | COMSAR / FP / NAV / SLF / STW | 2014 |
| 5.2.1.26 | Development of amendments to Part B of the 2008 IS Code on towing and anchor handling operations | MSC | SLF | | 2013 |

| STANDARDS OF TRAINING AND WATCHKEEPING (STW) | | | | | |
|---|---|---|---|---|---|
| **PLANNED OUTPUTS 2012-2013** | | | | | |
| **Number** | **Description** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Target completion year** |
| 5.1.2.1 | Making the provisions of MSC.1/Circ.1206/Rev.1 mandatory | MSC | DE | FSI / NAV / STW | 2013 |
| 5.2.1.7 | Review of general cargo ship safety | MSC | DE / DSC / FP / NAV / SLF / STW | | 2013 |
| 5.2.1.17 | Development of a mandatory Code of ships operating in polar waters | MSC / MEPC | DE | COMSAR / FP / NAV / SLF / STW | 2014 |
| 5.2.1.22 | Promotion of the implementation of the 1995 STCW-F Convention | MSC | STW | | Continuous |
| 5.2.2.1 | Development of guidance for the implementation of the 2010 Manila Amendments | MSC | STW | | 2013 |
| 5.2.2.3 | Validated model training courses | MSC | STW | | Continuous |
| 5.2.2.4 | Unlawful practices associated with certificates of competency | MSC | STW | | Annual |
| 5.2.2.9 (UO) | Development of guidance for personnel involved with tug-barge operations | MSC | STW | FP | 2014 |
| 5.2.2.10 (UO) | Revision of the Recommendations on training of personnel on mobile offshore units (MOUs) | MSC | STW | | 2013 |
| 5.2.2.11 (UO) | Proposed amendments to the STCW Code's colour vision requirement. | MSC | STW | | 2013 |
| 5.2.5.7 (UO) | Draft High-level review completed and First outline of the detailed review of the Global Maritime Distress and Safety System (GMDSS) | MSC | COMSAR | NAV / STW | 2013 |
| 5.2.6.1 | Development of an e navigation strategy implementation plan | MSC | NAV | COMSAR / STW | 2013 |

| Number | Description | Parent organ(s) | Coordinating organ(s) | Associated organ(s) | Target completion year |
|---|---|---|---|---|---|
| 5.4.1.1 | Guidelines on how to present relevant information to seafarers | MSC / MEPC | STW | | 2013 |
| 12.1.2.1 | Casualty analysis | MSC | FSI | BLG / FP / NAV / STW | Continuous |
| 12.2.1.3 | Enhancing the efficiency and user-friendliness of ISM Code | MSC / MEPC | STW | | 2013 |

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# ANNEX 37

## PROVISIONAL AGENDAS OF THE SUB-COMMITTEES

**SUB-COMMITTEE ON BULK LIQUIDS AND GASES (BLG) – 17TH SESSION**

Opening of the session

1 Adoption of the agenda

2 Decisions of other IMO bodies

3 Evaluation of safety and pollution hazards of chemicals and preparation of consequential amendments

4 Additional guidelines for implementation of the BWM Convention

5 Production of a manual entitled "Ballast Water Management – How to do it"

6 Improved and new technologies approved for ballast water management systems and reduction of atmospheric pollution

7 Development of international measures for minimizing the transfer of invasive aquatic species through biofouling of ships

8 Development of international code of safety for ships using gases or other low-flashpoint fuels

9 Development of a revised IGC Code

10 Consideration of the impact on the Arctic of emissions of Black Carbon from international shipping

11 Review of relevant non-mandatory instruments as a consequence of the amended MARPOL Annex VI and the $NO_x$ Technical Code

.1 Guidelines for replacement engines not required to meet the Tier III limit (MARPOL Annex VI)

.2 Other relevant guidelines pertaining to equivalents set forth in regulation 4 of MARPOL Annex VI and not covered by other guidelines

.3 Guidelines called for under paragraph 2.2.5.6 of the $NO_x$ Technical Code

12 Development of a Code for the transport and handling of limited amounts of hazardous and noxious liquid substances in bulk on offshore support vessels

13 Casualty analysis

14 Consideration of IACS unified interpretations

15 Biennial agenda and provisional agenda for BLG 18

16 Election of Chairman and Vice-Chairman for 2014

17 Any other business

18 Report to the Committees

**SUB-COMMITTEE ON DANGEROUS GOODS, SOLID CARGOES AND CONTAINERS (DSC) – 18TH SESSION**

Opening of the session

1 Adoption of the agenda

2 Decisions of other IMO bodies

3 Review of general cargo ship safety

4 Development of amendments to CSC 1972 and associated circulars

5 Development of measures to prevent loss of containers

6 Development of amendments to the IMSBC Code and supplements, including evaluation of properties of solid bulk cargoes

7 Development of amendments to the IMDG Code and supplements, including harmonization with the UN Recommendations on the transport of dangerous goods

8 Revision of the guidelines for packing of cargo transport units

9 Development of amendments to SOLAS and the relevant codes concerning mandatory carriage of appropriate atmosphere testing instruments on board ships

10 Casualty and incident reports and analysis

11 Biennial agenda and provisional agenda for DSC 18

12 Any other business

13 Report to the Maritime Safety Committee

**SUB-COMMITTEE ON FIRE PROTECTION (FP) – 56TH SESSION**

Opening of the session and election of Chairman and Vice-Chairman for 2013

1 Adoption of the agenda

2 Decisions of other IMO bodies

3 Development of measures to prevent explosions on oil and chemical tankers transporting low-flashpoint cargoes

4 Development of requirements for the fire resistance of ventilation ducts

5 Review of fire protection requirements for on-deck cargo areas

6 Review of the recommendations on evacuation analysis for new and existing passenger ships

7 Development of requirements for additional means of escape from machinery spaces

8 Development of requirements for ships carrying hydrogen and compressed natural gas vehicles

9 Consideration of IACS unified interpretations

10 Harmonization of the requirements for the location of entrances, air inlets and openings in the superstructures of tankers

11 Development of unified interpretations for chapter 7 of the 2000 HSC Code

12 Development of guidelines for use of fibre reinforced plastic (FRP) within ship structures

13 Analysis of fire casualty records

14 Development of amendments to SOLAS chapter II-2, the FTP Code and MSC/Circ.1120 to clarify the requirements for plastic pipes on ships

15 Consideration of amendments to SOLAS chapter II-2 on location of EEBDs

16 Development of amendments to the requirements for foam-type fire-extinguishers in SOLAS regulation II-2/10.5

17 Development of amendments to SOLAS regulation II-2/20 and associated guidance on air quality management for ventilation of closed vehicle spaces, closed ro-ro and special category spaces

18 Biennial agenda and provisional agenda for FP 57

19 Election of the Chairman and Vice-Chairman for 2014

20 Any other business

21 Review of general cargo ship safety

22 Development of interpretation of SOLAS regulation II-2/13.6 on means of escape from ro-ro spaces

23 Report to the Maritime Safety Committee

**SUB-COMMITTEE ON FLAG STATE IMPLEMENTATION (FSI) – 21ST SESSION**

Opening of the session

1 Adoption of the agenda

2 Decisions of other IMO bodies

3 Responsibilities of Governments and measures to encourage flag State compliance

4 Mandatory reports under MARPOL

5 Casualty statistics and investigations

6 Harmonization of port State control activities

7 PSC Guidelines on seafarers' hours of rest and PSC guidelines in relation to the Maritime Labour Convention, 2006

8 Development of guidelines on port State control under the 2004 BWM Convention

9 Comprehensive analysis of difficulties encountered in the implementation of IMO instruments

10 Review of the Survey Guidelines under the HSSC and the annexes to the Code for the Implementation of Mandatory IMO Instruments

11 Consideration of IACS Unified Interpretations

12 Measures to protect the safety of persons rescued at sea

13 Illegal unregulated and unreported (IUU) fishing and related matters

14 Review of general cargo ship safety

15 Biennial agenda and provisional agenda for FSI 22

16 Election of Chairman and Vice-Chairman for 2014

17 Any other business

17 Report to the Committees

## SUB-COMMITTEE ON RADIOCOMMUNICATIONS AND SEARCH AND RESCUE (COMSAR) – 17TH SESSION

Opening of the session

1 Adoption of the agenda

2 Decisions of other IMO bodies

3 Global Maritime Distress and Safety System (GMDSS):

.1 Review and modernization of the GMDSS

.2 Further development of the GMDSS master plan on shore-based facilities

.3 Consideration of operational and technical coordination provisions of maritime safety information (MSI) services, including the development and review of the related documents

4 ITU maritime radiocommunication matters:

.1 Consideration of radiocommunication ITU-R Study Group matters

.2 Consideration of ITU World Radiocommunication Conference matters

5 Consideration of developments in Inmarsat and Cospas-Sarsat:

6 Search and Rescue (SAR):

.1 Development of guidelines on harmonized aeronautical and maritime search and rescue procedures, including SAR training matters

.2 Further development of the Global SAR Plan for the provision of maritime SAR services, including procedures for routeing distress information in the GMDSS

7 Developments in maritime radiocommunication systems and technology

8 Development of amendments to the IAMSAR Manual

9 Development of measures to avoid false distress alerts

10 Development of measures to protect the safety of persons rescued at sea

11 Development of an e-navigation strategy implementation plan

12 Consideration of LRIT-related matters

13 Development of a mandatory Code for ships operating in polar waters

14 Biennial agenda and provisional agenda for COMSAR 18

15 Election of Chairman and Vice-Chairman for 2014

16 Any other business

17 Report to the Maritime Safety Committee

**SUB-COMMITTEE ON SAFETY OF NAVIGATION (NAV) – 59TH SESSION**

Opening of the session

1 Adoption of the agenda

2 Decisions of other IMO bodies

3 Routeing of ships, ship reporting and related matters

4 Application of the satellite navigation system "BeiDou" in the maritime field

5 ITU matters, including Radiocommunication ITU-R Study Group matters

6 Development of an e-navigation strategy implementation plan

7 Development of policy and new symbols for AIS aids to navigation

8 Review of general cargo ship safety

9 Revision of the information contained in the existing annexes to the Recommendation on the use of adequately qualified deep-sea pilots in the North Sea, English Channel and Skagerrak (resolution A.486(XII)

10 Revision of the Guidelines for the onboard operational use of shipborne automatic identification systems (AIS)

11 Consolidation of ECDIS-related IMO circulars

12 Consideration of ECDIS matters related to the implementation of the carriage requirements in SOLAS regulations V/19.2.10 and V/19.2.11

13 Development of explanatory footnotes to SOLAS regulations V/15, V/18, V/19 and V/27

14 Revision of the information contained in the existing annexes to the Recommendation on the use of adequately qualified deep-sea pilots in the Baltic (resolution A.480(XII))

15 Casualty analysis

16 Consideration of IACS unified interpretations

17 Biennial agenda and provisional agenda for NAV 60

18 Election of Chairman and Vice-Chairman for 2014

19 Any other business

20 Report to the Maritime Safety Committee

**SUB-COMMITTEE ON SHIP DESIGN AND EQUIPMENT (DE) – 57TH SESSION**

Opening of the session

1 Adoption of the agenda

2 Decisions of other IMO bodies

3 Consideration of IACS unified interpretations

4 Revision of the Standard specification for shipboard incinerators (resolution MEPC.76(40))

5 Development of amendments to SOLAS regulation II-1/40.2 concerning general requirements on electrical installations

6 Making the provisions of MSC.1/Circ.1206/Rev.1 mandatory

7 Development of a new framework of requirements for life-saving appliances

8 Development of safety objectives and functional requirements of the Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III

9 Development of amendments to the LSA Code for thermal performance of immersion suits

10 Development of amendments to the LSA Code for free-fall lifeboats with float-free capabilities

11 Development of a mandatory Code for ships operating in polar waters

12 Classification of offshore industry vessels and consideration of the need for a non-mandatory Code for offshore construction support vessels

13 Revision of testing requirements for lifejacket RTDs in resolution MSC.81(70)

14 Development of guidelines for wing-in-ground craft

15 Revision of the Recommendation on conditions for the approval of servicing stations for inflatable liferafts (resolution A.761(18))

16 Amendments to SOLAS regulation II-1/11 and development of associated guidelines to ensure the adequacy of testing arrangements for watertight compartments

17 Provisions for the reduction of noise from commercial shipping and its adverse impacts on marine life

18 Development of requirements for onboard lifting appliances and winches

19 Review of general cargo ship safety

20 Development of amendments to SOLAS regulations II-1/29.3.2 and 29.4.2, clarifying the requirements for steering gear trials

21 Biennial agenda and provisional agenda for DE 58

22 Election of Chairman and Vice-Chairman for 2014

23 Any other business

24 Development of amendments to the 2011 ESP Code

25 Report to the Maritime Safety Committee

## SUB-COMMITTEE ON STABILITY AND LOAD LINES AND ON FISHING VESSELS SAFETY (SLF) – 55TH SESSION

Opening of the session and election of Chairman and Vice-Chairman for 2013

1 Adoption of the agenda

2 Decisions of other IMO bodies

3 Development of second generation intact stability criteria

4 Development of guidelines on safe return to port for passenger ships

5 Development of guidelines for verification of damage stability requirements for tankers

6 Development of mandatory carriage requirements for stability instruments on board tankers

7 Review of the damage stability regulations for ro-ro passenger ships

8 Revision of SOLAS chapter II-1 subdivision and damage stability regulations

9 Development of provisions to ensure the integrity and uniform implementation of the 1969 TM Convention

10 Development of amendments to part B of the 2008 IS Code on towing and anchor handling operations

11 Consideration of IACS unified interpretations

12 Development of amendments to the criterion for maximum angle of heel in turns of the 2008 IS Code

13 Development of a mandatory Code for ships operating in polar waters

14 Biennial agenda and provisional agenda for SLF 56

15 Election of Chairman and Vice-Chairman for 2014

16 Any other business

17 Report to the Maritime Safety Committee

**SUB-COMMITTEE ON STANDARDS OF TRAINING AND WATCHKEEPING (STW) – 44TH SESSION**

Opening of the session

1 Adoption of the agenda

2 Decisions of other IMO bodies

3 Validation of model training courses

4 Unlawful practices associated with certificates of competency

5 Casualty analysis

6 Development of an e-navigation strategy implementation plan

7 Development of guidance for the implementation of the 2010 Manila Amendments

8 Promotion of the implementation of the 1995 STCW-F Convention

9 Development of guidelines for wing-in-ground craft

10 Role of the human element

.1 Guidelines on how to present relevant information to seafarers

.2 Enhancing the efficiency and user-friendliness of ISM Code

11 Development of guidance for personnel involved with tug-barge operations

12 Revision of the Recommendations on training of personnel on mobile offshore units (MOUs)

13 Development of a mandatory Code for ships operating in polar waters

14 Review and modernization of the Global Maritime Distress and Safety System (GMDSS)

15 Review of general cargo ship safety

16 Biennial agenda and provisional agenda for STW 45

17 Any other business

18 Proposed amendment to the STCW Code's colour vision requirements

19 Report to the Maritime Safety Committee

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## ANNEX 38

## POST-BIENNIAL AGENDA OF THE COMMITTEE

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **ACCEPTED POST-BIENNIAL OUTPUTS** | | | | | | | | |
| **Number** | **Biennium (when the output was placed on the post-biennial agenda)** | **Reference to High-level Actions** | **Description** | **Parent organ(s)** | **Coordinating organs(s)** | **Associated organ(s)** | **Timescale (sessions)** | **References** |
| 1 | 2012-2013 | 6.1.1 | Non-mandatory instruments: measures to enhance the security of closed cargo transport units and of freight containers | MSC / FAL | | | 2 | |
| 7 | 2012-2013 | 2.0.1 | Mandatory application of the Performance standard for protective coatings for void spaces on bulk carriers and oil tankers | MSC | DE | | 2 | MSC 76/23, paragraphs 20.41.2 and 20.48; DE 50/27, section 4 |
| 8 | 2012-2013 | 2.0.1 | Performance standard for protective coatings for void spaces on all types of ships | MSC | DE | | 2 | MSC 76/23, paragraphs 20.41.2 and 20.48 |
| 9 | 2012-2013 | 2.0.1 | Revision of the provisions for helicopter facilities in SOLAS and the MODU Code | MSC | DE | | 2 | MSC 86/26, paragraph 23.39 |

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **ACCEPTED POST-BIENNIAL OUTPUTS** | | | | | | | | |
| **Number** | **Biennium (when the output was placed on the post-biennial agenda)** | **Reference to High-level Actions** | **Description** | **Parent organ(s)** | **Coordinating organs(s)** | **Associated organ(s)** | **Timescale (sessions)** | **References** |
| 10 | 2012-2013 | 5.1.1 | Development of life safety performance criteria for alternative design and arrangements for fire safety (MSC/Circ.1002) | MSC | FP | | 1 | MSC 90/28, paragraph 25.12 |
| 11 | 2012-2013 | 5.2.1 | Clarification of the STCW-F Convention provisions and follow-up action to the associated Conference resolutions | MSC | STW | | 2 | STW 34/14, paragraph 11.8 |
| 12 | 2012-2013 | 5.2.1 | Smoke control and ventilation | MSC | FP | | 2 | FP 46/16, section 4 |
| 32 | 2012-2013 | 12.2.1 | Recommendations related to navigational sonar on crude oil tankers | MSC | DE | | 1 | MSC 91/22, Paragraph 19.23 |
| 33 | 2012-2013 | 12.2.1 | Training in hot work procedures on crude oil tankers | MSC | STW | FP | 1 | MSC 91/22, Paragraph 19.31 |
| 34 | 2012-2013 | 12.2.1 | Considerations related to the double sheathed low-pressure fuel pipes for fuel injection systems in engines on crude oil tankers | MSC | FP | | 1 | MSC 91/22, Paragraph 19.13. |
| 38 | 2012-2013 | 5.2.5 | Approval of the | MSC | COMSAR | NAV / STW | 2 | MSC 90/28, paragraph 25.18 |

| Maritime Safety Committee (MSC) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **ACCEPTED POST-BIENNIAL OUTPUTS** | | | | | | | | | |
| **Number** | **Biennium (when the output was placed on the post-biennial agenda)** | **Reference to High-level Actions** | **Description** | **Parent organ(s)** | **Coordinating organs(s)** | **Associated organ(s)** | **Timescale (sessions)** | **References** |
| | | | modernization plan of the Global Maritime Distress and Safety System (GMDSS) | | | | | |
| 40 | 2012-2013 | 5.2.2 | Finalization of guidance for the implementation of the 2010 Manila amendments | MSC | STW | | 3 | MSC 89/25, paragraph 22.41 |
| 41 | 2012-2013 | 5.2.1 | Development of amendments to the 2009 MODU Code concerning lifeboat drills | MSC | DE | | 2 | MSC 89/25, paragraph 22.24 |
| 42 | 2012-2013 | 5.2.1 | Review of the 2009 Code on Alerts and Indicators | MSC | DE | NAV | 2 | MSC 89/25, paragraph 22.25 |
| 43 | 2012-2013 | 5.2.1 | Development of amendments to the provisions of SOLAS chapter II 2 relating to secondary means of venting cargo tanks | MSC | FP | BLG | 1 | MSC 90/28, paragraph 25.5 |
| 45 | 2012-2013 | 5.2.1 | Development of a | MSC | DE | | 1 | MSC 90/28, paragraph 25.31, |

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **ACCEPTED POST-BIENNIAL OUTPUTS** | | | | | | | | |
| **Number** | **Biennium (when the output was placed on the post-biennial agenda)** | **Reference to High-level Actions** | **Description** | **Parent organ(s)** | **Coordinating organs(s)** | **Associated organ(s)** | **Timescale (sessions)** | **References** |
| | | | requirement for hoist winches to be tested following any maintenance, repair or modification (MSC.1/Circ.1331) | | | | | MSC.1/Circ.1331 |
| 47 | 2012-2013 | 5.2.1 | Development of amendments to the Guidelines for vessels with dynamic positioning (DP) systems (MSC/Circ.645) | MSC | DE | | 2 | MSC 90/28, paragraph 25.34, MSC/Circ.645 |
| 50 | 2012-2013 | 5.2.2 | Proposed Revised guidelines for model course development, updating and validation processes | MSC | STW | | 2 | MSC 91/22, paragraph 19.28 |
| 51 | 2012-2013 | 5.2.2 | Proposed review of STCW passenger ship specific safety training | MSC | STW | | 2 | MSC 91/22, paragraph 19.30 |
| 52 | 2012-2013 | 5.2.4 | Development of performance standards for multi-system shipborne navigation receivers | MSC | NAV | | 2 | MSC 90/28, paragraph 25.25 |

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **ACCEPTED POST-BIENNIAL OUTPUTS** | | | | | | | | |
| **Number** | **Biennium (when the output was placed on the post-biennial agenda)** | **Reference to High-level Actions** | **Description** | **Parent organ(s)** | **Coordinating organs(s)** | **Associated organ(s)** | **Timescale (sessions)** | **References** |
| 54 | 2012-2013 | 7.2.2 | Safety aspects of alternative tanker designs assessed | MSC / MEPC | BLG | | 2 | BLG 3/18, paragraph 15.7, Work on this output is to be carried out when a proposal for an alternative tanker design is submitted to the Organization. |
| 55 | 2012-2013 | 5.2.1 | Adoption of the revised IGC Code | MSC | BLG | DE / FP / SLF / STW | 2 | |
| 56 | 2012-2013 | 5.2.6 | Adoption of an e navigation strategy implementation plan | MSC | NAV | COMSAR / STW | 2 | |
| 57 | 2012-2013 | 5.2.5 | Detailed review endorsed by COMSAR 19 and approved by MSC 95 and first outline of the modernization plan. | MSC | COMSAR | NAV / STW | 2 | MSC 90/28, paragraph 25.18 |

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## ANNEX 39

## REPORT ON THE STATUS OF PLANNED OUTPUTS FOR THE 2012-2013 BIENNIUM

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 1.1.1.1 | Permanent analysis, demonstration and promotion of the linkage between a safe, secure, efficient and environmentally friendly maritime transport infrastructure, the development of global trade and the world economy and the achievement of the Millennium Development Goals (MDGs) | Continuous | Assembly | Council | MSC / MEPC / FAL / LEG / TCC / Secretariat | | | |
| 1.1.2.1 | Cooperation with FAO: preparation and holding of the third meeting of the Joint IMO/FAO Working Group on IUU fishing and related matters, including the adoption of a new treaty to facilitate the implementation of the technical provisions to the 1993 Torremolinos Protocol | 2013 | MSC / MEPC | FSI / SLF | | In progress | | MSC 89/25, paragraphs 9.15 to 9.38 and annex 18; Draft Agreement to facilitate implementation of 1993 Torremolinos Protocol to be adopted by Diplomatic Conference in October 2012 |

* New unplanned outputs are shown as (UO)

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 1.1.2.2 | Cooperation with IACS: consideration of unified interpretations | Continuous | MSC / MEPC | | BLG / DE / FP / FSI / NAV / SLF | Ongoing | | MSC.1/Circs.1416, 1422 to 1427, 1429, 1433 to 1437, LL.3/Circ.208 |
| 1.1.2.3 | Development of amendments to the 2011 ESP Code | Continuous | MSC | DE | | Ongoing | | |
| 1.1.2.4 | Cooperation with IAEA: formalized emergency arrangements for response to nuclear/radiological emergencies from ships, including IMO contribution to the next version of the "Joint Radiation Emergency Management Plan of the International Organizations" | Continuous | MSC / MEPC | Secretariat | | Ongoing | | |
| 1.1.2.5 | Cooperation with ILO: development of PSC guidelines on seafarers' hours of rest taking into account the Maritime Labour Convention, 2006 | 2013 | MSC | FSI | | In progress | | |
| 1.1.2.7 | Cooperation with IHO: hydrographic issues | Continuous | MSC | NAV | | Ongoing | | MSC 90/28, paragraphs 10.12 and 10.26 |
| 1.1.2.8 | Cooperation with data providers: protocols on data exchange with international, regional and national entities | Continuous | MSC / MEPC / FAL / LEG / TCC | Secretariat | | Ongoing | | |

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 1.1.2.10 | Cooperation with ICAO: annual meeting of the Joint ICAO/IMO Working Group on the Harmonization of Aeronautical and Maritime Search and Rescue (monitoring of SAR developments, continuous review of the IAMSAR Manual and developing recommendations) | Continuous | MSC | COMSAR | DE | Ongoing | | |
| 1.1.2.11 | ["Deleted pending final consideration by DE 57".] Review of provisions for helicopters in SOLAS | Continuous | MSC | DE | | Postponed | | |
| 1.1.2.12 | Cooperation with ITU: consideration of matters related to the Radiocommunication ITU R Study Group and ITU World Radiocommunication Conference | Continuous | MSC | COMSAR | NAV | Ongoing | | MSC 90/28, paragraphs 8.15 to 8.17 and 25.50 |
| 1.1.2.15 | Liaison statements to/from IALA: VTS, aids to navigation, e-navigation and AIS matters | Continuous | MSC | NAV | | Ongoing | | |
| 1.1.2.16 | Liaison statements to/from IEC: radiocommunications and safety of navigation | Continuous | MSC | COMSAR | NAV | Ongoing | | |
| 1.1.2.17 | Liaison statements to/from IHO: hydrographic matters and promotion of ENCs covering various parts of the globe | Continuous | MSC | NAV | | Ongoing | | |

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 1.1.2.18 | Liaison statements to/from ILO: seafarers' issues | Continuous | MSC | STW | | Ongoing | | |
| 1.1.2.19 | Liaison statements to/from ITU: radiocommunications | Continuous | MSC | COMSAR | NAV | Ongoing | | MSC 90/28, paragraph 8.2 |
| 1.1.2.20 | Liaison statements to/from UNHCR: persons rescued at sea | Continuous | MSC / FAL | COMSAR | NAV | Ongoing | | |
| 1.1.2.21 | Liaison statements to/from WMO: meteorological issues | Continuous | MSC | NAV | | Ongoing | | MSC 90/28,paragraph 25.49.9 |
| 1.1.2.22 | Policy input/guidance to IAEA: development of carriage requirements for class 7 radioactive material and development of guidance for coastal States on emergencies at sea involving radioactive material | Continuous | MSC | DSC | | Ongoing | | |
| 1.1.2.23 | Policy input/guidance to ILO: development of PSC guidelines in the context of the Maritime Labour Convention, 2006 | Continuous | MSC | FSI | | Ongoing | | |
| 1.1.2.24 | Policy input/guidance to ILO/FAO: Preparation and holding of the third meeting of the Joint FAO/IMO ad hoc Working Group on IUU Fishing and Related Matters (JWG) | 2013 | MSC | FSI | SLF | In progress | | |
| 1.1.2.25 | Policy input/guidance to ISO TC 8: development of industry consensus standards | Continuous | MSC / MEPC | Secretariat | | Ongoing | | |

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 1.1.2.26 | Policy input/guidance to PSC regimes: related IMO developments | Continuous | MSC / MEPC | FSI | | Ongoing | | Resolution A.1052(27) on Procedures for port State control, 2011 |
| 1.1.2.27 | Policy input/guidance to UN Sub-Committee on Dangerous Goods: harmonization of multimodal transport of dangerous goods | Continuous | MSC | DSC | | Ongoing | | |
| 1.1.2.40 | Policy and strategy input to CTITF and any of its 30 entities for the implementation of the IMO related aspects of the UN Global Counter-Terrorism Strategy | Continuous | MSC / FAL / LEG / TCC | | | Ongoing | | |
| 1.3.5.1 | Harmonized provisions relating to the safe, secure and efficient carriage of dangerous goods following participation in the activities of UNCOE TDG, GHS and IAEA | Continuous | MSC / MEPC | DSC | Secretariat | Ongoing | | |
| 1.3.5.2 | Development of amendments to the IAMSAR Manual | Continuous | MSC | COMSAR | | Ongoing | | |
| 2.0.1.2 | Means for recharging air bottles for air breathing apparatus | 2013 | MSC | FP | | Completed | | MSC.338(91), para 27, MSC 90/28, annex 25, FP 55/23, para 15.6 |

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 2.0.1.3 | Development of guidelines for verification of damage stability requirements for tankers | 2013 | MSC | SLF | DE / STW | Completed | | |
| 2.0.1.4 | [Deleted] | 2013 | MSC | | | | | Decision to delete output - MSC 90/28, paragraph 13.8 |
| 2.0.1.5 | Development of provisions to ensure the integrity and uniform implementation of the 1969 TM Convention | 2013 | MSC | SLF | DE / STW | In progress | | |
| 2.0.1.6 | Development of revised performance testing and approval standards for fire safety systems | 2012 | MSC | FP | | Completed | | MSC.327(90), MSC 90/28, paragraphs 11.7 to 11.9; MSC 91/22, paras. 3.82 and 3.83 |
| 2.0.1.13 | Development of a Code for Recognized Organizations | 2013 | MSC / MEPC | FSI | | In progress | | MEPC 64/23, annex 23 |
| 2.0.1.19 | Comprehensive review of issues related to the responsibilities of Governments and development of measures to encourage flag State compliance | Continuous | MSC / MEPC | | FSI | Ongoing | | |
| 2.0.1.22 | GISIS module on mandatory and non-mandatory requirements | Annual | MSC / MEPC / FAL / LEG / TCC | Secretariat | FSI | Ongoing | | |

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 2.0.1.23 | Non-mandatory instruments: development of unified interpretations for chapter 7 of the 2000 HSC Code | 2013 | MSC | FP | | In progress | | MSC 87/26, para. 24.16 |
| 2.0.1.24 | Mandatory instruments: development of amendments to SOLAS regulation II-1/40.2 concerning general requirements on electrical installations | 2013 | MSC | DE | | In progress | | |
| 2.0.1.25 (UO) | Development of mandatory carriage requirements for stability instruments on board tankers | 2013 | MSC | SLF | | | | MSC 90/28, paragraph 25.37 |
| 2.0.2.1 | Review of the Code for the Implementation of Mandatory IMO Instruments and consolidated audit summary reports, adoption of the new IMO Instruments Implementation (III) Code and making the III Code and auditing mandatory | 2013 | Assembly | Council | MSC / MEPC / FSI | In progress | | A.1054(27) on Code for the implementation of mandatory IMO instruments, 2011 |
| 2.0.2.2 | Implementation of approved proposals for the further development of the Audit Scheme | Continuous | Assembly | Council | MSC / MEPC / FAL / LEG / TCC / Secretariat | In progress | | |

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 2.0.3.1 | Technical guidance for the establishment of regional MRCCs and MRSCs in Africa, supported by the ISAR Fund | Continuous | MSC | Secretariat | COMSAR | Ongoing | | |
| 2.0.3.2 | Further development of the Global SAR Plan for the provision of maritime SAR services, including procedures for routeing distress information in the GMDSS | Continuous | MSC | COMSAR | | Ongoing | | |
| 2.0.3.4 | Reports on the Cospas-Sarsat System monitored and the list of IMO documents and publications which should be held by MRCCs updated | Continuous | MSC | Secretariat | COMSAR | Ongoing | | |
| 2.0.3.5 | Development of guidelines on harmonized aeronautical and maritime search and rescue procedures, including SAR training matters | 2013 | MSC | COMSAR | | In progress | | |
| 3.4.1.1 | Guidance on identifying the emerging needs of developing countries, in particular SIDS and LDCs | Continuous | MSC / MEPC / FAL / LEG / TCC | | | Ongoing | | |
| 3.5.1.2 | Input to the ITCP on maritime safety and security | Continuous | MSC | | | Ongoing | | |

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 4.0.1.7 (UO) | Proposals to ensure a forward-looking, efficient and cost-conscious Organization with strengthened and knowledge-based authority in global standard setting through the Secretary-General's Review and Reform mechanism | 2013 | Secretariat | Council | MSC / MEPC / FAL / LEG / TCC | | | |
| 4.0.2.1 | Guidance on the establishment or further development of information systems (databases, websites, etc.) as part of GISIS | Continuous | MSC / MEPC / FAL / LEG / TCC | | FSI | Ongoing | | |
| 4.0.2.2 | Development and management of mandatory IMO number schemes | Continuous | MSC | FSI | Secretariat | Ongoing | | |
| 4.0.2.3 | Protocols on data exchange with other international, regional and national data providers | Continuous | MSC / MEPC / FAL / LEG / TCC | FSI | Secretariat | Ongoing | | |
| 4.0.5.1 | Revised guidelines on organization and method of work, as appropriate | Continuous | MSC / MEPC | Secretariat | | Ongoing | | |
| 5.1.1.1 | Development of guidelines on safe return to port for passenger ships | 2013 | MSC | SLF | | In progress | | |
| 5.1.1.2 | Review of damage stability regulations for ro-ro passenger ships | 2013 | MSC | SLF | | In progress | | |

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 5.1.1.3 | Review of the recommendations on evacuation analysis for new and existing passenger ships | 2013 | MSC | FP | | In progress | | MSC 83/28, paras 8.7 and 25.25 |
| 5.1.2.1 | Making the provisions of MSC.1/Circ.1206/Rev.1 mandatory | 2013 | MSC | DE | FSI / NAV / STW | In progress | | |
| 5.1.2.2 | Development of measures to protect the safety of persons rescued at sea | 2013 | MSC / FAL | COMSAR | FSI | In progress | | |
| 5.1.2.3 | Development of a new framework of requirements for life-saving appliances | 2013 | MSC | DE | | In progress | | |
| 5.1.2.4 | Development of performance standards for recovery systems for all types of ship | 2012 | MSC | DE | | Completed | | MSC 90/28, paragraphs 9.14 to 9.18 and annex 13 |
| 5.1.2.5 | Development of training standards for recovery systems | 2012 | MSC | STW | DE | In progress | | |
| 5.1.3.2 | ITCP support for the implementation of the Djibouti Code of Conduct concerning the repression of piracy and armed robbery against ships in the western Indian Ocean and the Gulf of Aden | Continuous | MSC / Assembly / TCC | Secretariat | | Ongoing | | TC 62/3 Biennial ITCP report |
| 5.2.1.1 | Development of amendments to the criterion for maximum angle of heel in turns of the 2008 IS Code | 2013 | MSC | SLF | | In progress | | |

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 5.2.1.2 | Amendments to SOLAS related to the fire resistance of ventilation ducts | 2013 | MSC | FP | | In progress | | MSC 83/28, para 25.22 |
| 5.2.1.3 | Development of international code of safety for ships using gases or other low flashpoint fuels | 2013 | MSC | BLG | DE / FP | In progress | | MSC 78/26, para 24.11 |
| 5.2.1.4 | Development and approval of a revised IGC Code | 2013 | MSC | BLG | DE / FP / SLF / STW | In progress | | MSC 83/28, paras 25.7 and 25.16 |
| 5.2.1.5 | [Deleted] | 2013 | MSC | | | | | MSC 90 decided to delete the output and combine with output 5.2.1.15 |
| 5.2.1.6 | Development of requirements for additional means of escape from machinery spaces. | 2013 | MSC | FP | | In progress | | MSC 83/28, para 25.23 |
| 5.2.1.7 | Review of general cargo ship safety | 2013 | MSC | DE / DSC / FP / NAV / SLF / STW | | Postponed | | MSC 90/28, para. 25.10 |
| 5.2.1.8 | Harmonized requirements for the location of entrances, air inlets and openings in the superstructures of tankers | 2013 | MSC | FP | BLG | In progress | | MSC 83/28, para 25.24.2 |
| 5.2.1.9 | Review of fire protection requirements for on-deck cargo areas | 2013 | MSC | FP | DSC | In progress | | MSC 83/28, para 25.21 |
| 5.2.1.10 | Development of requirements for ships carrying hydrogen and compressed natural gas vehicles | 2013 | MSC | FP | | In progress | | MSC 83/28, para 25.23 |

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 5.2.1.11 | Development of safety objectives and functional requirements of the Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III | 2013 | MSC | DE | | In progress | | |
| 5.2.1.12 | Development of amendments to the LSA Code for thermal performance of immersion suits | 2013 | MSC | DE | | In progress | | |
| 5.2.1.13 | Development of amendments to the LSA Code for free-fall lifeboats with float-free capabilities | 2013 | MSC | DE | | In progress | | |
| 5.2.1.14 | Development of second generation intact stability criteria | 2013 | MSC | SLF | | In progress | | |
| 5.2.1.15 | Revision of SOLAS chapter II 1 subdivision and damage stability regulations | 2012 | MSC | SLF | | In progress | | |
| 5.2.1.16 | [Deleted] | 2012 | MSC | | | | | MSC 90 decided to delete the output and combined with output 5.2.1.15 |
| 5.2.1.17 | Development of a mandatory Code of ships operating in polar waters | 2014 | MSC / MEPC | DE | COMSAR / FP / NAV / SLF / STW | In progress | | MSC 86/26, para. 23.32 |
| 5.2.1.18 | Development of a non-mandatory instrument on regulations for non-convention ships | 2013 | MSC | FSI | | In progress | | |

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 5.2.1.19 | Review and update of the Survey Guidelines under the Harmonized System of Survey and Certification and the annexes to the Code for the Implementation of Mandatory IMO Instruments | 2013 | MSC / MEPC | FSI | | Completed | | A.1053(27) on Survey Guidelines under the Harmonized System of Survey and Certification (HSSC), 2011; A.1054(27) on Code for the implementation of mandatory IMO instruments, 2011 |
| 5.2.1.20 | Protection against noise on board ships | 2012 | MSC | DE | | Completed | | MSC 90/28, paragraphs 9.33 to 9.36 and annex 14 |
| 5.2.1.21 | Classification of offshore industry vessels and consideration of the need for a non-mandatory code for offshore construction support vessels | 2013 | MSC | DE | | In progress | | |
| 5.2.1.22 | Promotion of the implementation of the 1995 STCW-F Convention | Continuous | MSC | STW | | Ongoing | | |
| 5.2.1.23 | Development of guidelines for use of Fibre Reinforced Plastic (FRP) within ship structures | 2013 | MSC | FP | DE | In progress | | MSC 87/26, para. 24.14; MSC 90/28, para. 9.41 |
| 5.2.1.24 | Revision of testing requirements for lifejacket RTDs in resolution MSC.81(70) | 2013 | MSC | DE | | In progress | | |
| 5.2.1.25 | Development of guidelines for wing-in-ground craft | 2013 | MSC | DE | COMSAR / FP / NAV / SLF / STW | In progress | | MSC 88/26, para. 23.13 |

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 5.2.1.26 | Development of amendments to Part B of the 2008 IS Code on towing and anchor handling operations | 2013 | MSC | SLF | | In progress | | |
| 5.2.1.27 | Revision of the Recommendation on conditions for the approval of servicing stations for inflatable liferafts (resolution A.761(18)) | 2013 | MSC | DE | | In progress | | |
| 5.2.1.28 | Amendments to SOLAS regulation II-1/11 and development of associated Guidelines to ensure the adequacy of testing arrangements for watertight compartments | 2013 | MSC | DE | | In progress | | |
| 5.2.1.29 (UO) | Development of amendments to SOLAS chapter II 2, the FTP Code and MSC/Circ.1120 to clarify the requirements for plastic pipes on ships | 2013 | MSC | FP | | | | MSC 88/26, para. 23.12 |
| 5.2.1.30 (UO) | Development of amendments to the requirements for foam-type fire extinguishers in SOLAS regulation II 2/10.5 | 2013 | MSC | FP | | | | MSC 89/25, paragraph 22.9 |

| Maritime Safety Committee (MSC) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 5.2.1.31 (UO) | Development of requirements for onboard lifting appliances and winches | 2014 | MSC | DE | | | | |
| 5.2.1.32 (UO) | Development of an interpretation of SOLAS regulation II-1/13.6 on means of escape from ro-ro cargo spaces | 2013 | MSC | FP | | | | MSC 90/28, paragraph 25.13 |
| 5.2.1.33 (UO) | Development of amendments to SOLAS regulations II 1/29.3.2 and 29.4.2 clarifying the requirements for steering gear trials | 2013 | MSC | DE | | | | MSC 90/28, paragraph 25.33 |
| 5.2.1.34 (UO) | Consideration of amendments to SOLAS chapter II-2 on location of EEBDs | 2013 | MSC | FP | | | | MSC 88/26, para. 23.10 |
| 5.2.1.35 (UO) | Development of amendments to SOLAS regulation II-2/20 and associated guidance on air quality management for ventilation of closed vehicle spaces, closed ro-ro and special category spaces | 2013 | MSC | FP | | | | MSC 88/26, para. 23.11 |
| 5.2.2.1 | Non-mandatory instruments: development of guidance for the implementation of the 2010 Manila Amendments | 2013 | MSC | STW | | In progress | | |

| Maritime Safety Committee (MSC) | | | | | | | | |
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| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 5.2.2.3 | Validated model training courses | Continuous | MSC | STW | | Ongoing | | |
| 5.2.2.4 | Reports on unlawful practices associated with certificates of competency | Annual | MSC / Secretariat | STW | | Ongoing | | |
| 5.2.2.5 | Reports to the MSC on information communicated by STCW Parties | Annual | MSC | Secretariat | | Ongoing | | |
| 5.2.2.6 | Development of amendment to SOLAS to mandate enclosed space entry and rescue drills | 2012 | MSC | DSC | BLG / STW | In progress | | MSC 90/28, paragraph 12.17 |
| 5.2.2.7 | Development of amendments to the FSS Code for communication equipment for fire-fighting teams | 2012 | MSC | FP | | Completed | | FP 55, para 18.6, MSC.338(91), para 26 |
| 5.2.2.8 | Preparation of guidelines for the implementation of the medical standards of the Manila amendments | 2013 | MSC | STW | | Completed | | |
| 5.2.2.9 (UO) | Development of guidance for personnel involved with tug-barge operations | 2014 | MSC | STW | FP | | | MSC 90/28, paragraph 25.42 |
| 5.2.2.10 (UO) | Revision of the Recommendations on training of personnel on mobile offshore units (MOUs) | 2013 | MSC | STW | | | | MSC 90/28, paragraph 25.44 |
| 5.2.2.11 (UO) | Proposed amendments to the STCW Code's colour vision requirement. | 2013 | MSC | STW | | | | MSC 91/22, paragraph 19.29 |

| Maritime Safety Committee (MSC) | | | | | | | | |
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| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 5.2.3.1 | Development of amendments to CSC 1972 and associated circulars | 2013 | MSC | DSC | | In progress | | |
| 5.2.3.2 | Development of measures to prevent loss of containers | 2013 | MSC | DSC | DE / SLF / STW | Postponed | | Included in agenda for DSC 17 |
| 5.2.3.3 | Development of amendments to the IMSBC Code, including evaluation of properties of solid bulk cargoes | Continuous | MSC / MEPC | DSC | | In progress | | MSC 91/19/Add.1 |
| 5.2.3.4 | Development of amendments to the IMDG Code and supplements | Continuous | MSC | DSC | | Ongoing | | |
| 5.2.3.5 | Harmonization of the IMDG Code with the UN Recommendations on the Transport of Dangerous Goods | Continuous | MSC | DSC | | Ongoing | | |
| 5.2.3.6 | Review of fire protection arrangements for the stowage of water reactive materials | 2013 | MSC | DSC | FP | Completed | | MSC 83/28, para. 25.12 |
| 5.2.3.9 | Revised guidelines for packing of cargo transport units | 2013 | MSC | DSC | | In progress | | MSC 90/28, paragraph 12.13 |
| 5.2.3.10 | Measures to prevent fires and explosions on chemical tankers and product tankers under 20,000 deadweight tonnes operating without inert gas systems | 2013 | MSC | FP | BLG / DE | In progress | | MSC 83/28, para. 8.14 |

| Maritime Safety Committee (MSC) | | | | | | | | |
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| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 5.2.3.11 | Provisions for the installation of equipment for detection of radioactive sources or radioactive contaminated objects | 2012 | MSC | DSC | | Completed | | DSC 16/15, section 9 |
| 5.2.3.12 (UO) | Development of amendments to SOLAS and the relevant codes concerning mandatory carriage of appropriate atmosphere testing instruments on board ships | 2013 | MSC | DSC | BLG / FP / STW | | | MSC 91/22, paragraph 19.8 |
| 5.2.4.1 | New routeing measures and mandatory ship reporting systems, including associated protective measures for PSSAs | Continuous | MSC | NAV | | Ongoing | | |
| 5.2.4.2 | Revision of the Recommendation for the protection of the AIS VHF Data Link (resolution MSC.140(76)) | 2013 | MSC | COMSAR | | Completed | | |
| 5.2.4.3 | Amendments to the General Provisions on Ships' Routeing (resolution A.572(14)), as amended), | 2013 | MSC | NAV | | Completed | | MSC 91 - Adopted amendments to the General Provisions on Ships' Routeing (resolution A.572(14)), as amended), for dissemination by means of SN.1/Circ.319, subject to confirmation by the Assembly. MSC 91/22, paragraph 12.7 |

| Maritime Safety Committee (MSC) | | | | | | | | |
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| 5.2.4.4 | Implementation of LRIT system | Continuous | MSC | COMSAR | | Ongoing | | |
| 5.2.4.6 | Consideration of LRIT matters | Continuous | MSC | COMSAR | | Ongoing | | |
| 5.2.4.7 | Amendments to the Performance standards for VDR and S-VDR | 2012 | MSC | NAV | | In progress | | MSC.333(90) on Revised performance standards for shipborne voyage data recorders (VDR) |
| 5.2.4.8 | Development of policy and new symbols for AIS Aids to Navigation | 2013 | MSC | NAV | | In progress | | |
| 5.2.4.9 | Development of Performance Standards for Electronic Inclinometers | 2012 | MSC | NAV | SLF | Postponed | | MSC 91 endorsed MSC resolution with a view to adoption by MSC 92. MSC 91/22, paragraph 12.13 |
| 5.2.4.11 (UO) | Revision of the information contained in the existing annexes to the Recommendation on the use of adequately qualified deep sea pilots in the North Sea, English Channel and Skagerrak (resolution A.486(XII)) | 2013 | MSC | NAV | | | | MSC 90/28, paragraph 25.22 |
| 5.2.4.12 (UO) | Revision of the information contained in the existing annexes to the Recommendation on the use of adequately qualified deep-sea pilots in the Baltic (resolution A.480(XII)) | 2013 | MSC | NAV | | | | MSC 90/28, paragraph 25.23 |

| Maritime Safety Committee (MSC) | | | | | | | | |
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| 5.2.4.13 (UO) | Revision of the Guidelines for the on board operational use of shipborne automatic identification systems (AIS) | 2013 | MSC | NAV | COMSAR | | | MSC 90/28, paragraph 25.24 |
| 5.2.4.14 (UO) | Consolidation of ECDIS-related IMO circulars | 2014 | MSC | NAV | | | | MSC 90/28, paragraph 25.26 |
| 5.2.4.15 (UO) | Development of explanatory footnotes to SOLAS regulations V/15, V/18, V/19 and V/27 | 2014 | MSC | NAV | | | | MSC 90/28, paragraph 25.27 |
| 5.2.4.16 (UO) | Application of the satellite navigation system "BeiDou" in the maritime field | 2014 | MSC | NAV | | | | MSC 91/22 paragraph 19.20 |
| 5.2.4.17 (UO) | Consideration of ECDIS matters related to the implementation of the carriage requirements in SOLAS regulations V/19.2.10 and V/19.2.11 | 2014 | MSC | NAV | | | | MSC 91/22, paragraph 19.21 |
| 5.2.5.1 | Consideration of operational and technical coordination provisions of maritime safety information (MSI) services, including development and review of related documents | Continuous | MSC | COMSAR | | Ongoing | | |
| 5.2.5.2 | Development of measures to avoid false distress alerts | 2013 | MSC | COMSAR | | In progress | | |
| 5.2.5.3 | Further development of the GMDSS master plan on shore-based facilities | Continuous | MSC | COMSAR | | Ongoing | | |

| Maritime Safety Committee (MSC) | | | | | | | | |
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| 5.2.5.4 | Consideration of developments in Inmarsat and Copsas-Sarsat | Continuous | MSC | COMSAR | | Ongoing | | |
| 5.2.5.5 | Developments in maritime radiocommunication systems and technology | 2013 | MSC | COMSAR | | In progress | | |
| 5.2.5.6 | Scoping exercise to establish the need for a review of the elements and procedures of the GMDSS | 2012 | MSC | COMSAR | | Completed | | |
| 5.2.5.7 (UO) | Draft High-level review completed and First outline of the detailed review of the Global Maritime Distress and Safety System (GMDSS) | 2013 | MSC | COMSAR | NAV / STW | | | MSC 90/28, paragraph 25.18 |
| 5.2.6.1 | Development of an e navigation strategy implementation plan | 2013 | MSC | NAV | COMSAR / STW | In progress | | |
| 5.3.1.1 | Revised guidelines on control and compliance measures to enhance maritime security, if necessary | Continuous | MSC | | | Ongoing | | |
| 5.3.1.2 | Review of procedures for PSC | 2013 | MSC / MEPC | FSI | | In progress | | |
| 5.3.1.3 | Consideration of the efficacy of the Container Inspection Programme | 2013 | MSC | DSC | | Completed | | MSC 90/28, paragraph 12.1 |
| 5.3.1.4 | Promote the harmonization of PSC activities | Continuous | MSC / MEPC | FSI | | Ongoing | | |

| Maritime Safety Committee (MSC) | | | | | | | | |
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| 5.3.1.5 | Methodology for the in-depth analysis of annual PSC reports | 2013 | MSC / MEPC | FSI | | In progress | | |
| 5.3.1.6 | A risk assessment comparison between marine casualties and incidents and PSC inspections | Continuous | MSC / MEPC | FSI | | Ongoing | | |
| 5.3.1.7 | Development of guidance for Approved Continuous Examination Programmes (ACEP) | 2013 | MSC | DSC | | Completed | | |
| 5.4.1.1 | Guidelines on how to present relevant information to seafarers | 2013 | MSC / MEPC | STW | | Postponed | | |
| 6.1.1.1 | Guidelines and guidance on the implementation and interpretation of SOLAS chapter XI-2 and the ISPS Code | Continuous | MSC | | | In progress | | |
| 6.1.1.2 | Measures to enhance the security of closed cargo transport units and of freight containers | Continuous | MSC / FAL | | | In progress | | |
| 6.1.2.1 | Advice and guidance on issues, as may be requested, in connection with implementation of SUA 1988/2005 in the context of international efforts to combat terrorism and proliferation of weapons of mass destruction and related materials | Continuous | LEG | MSC | | Ongoing | | LEG 99 recommended retaining this PO and deleting the duplicate PO 1.1.2.42. No issues referred to LEG 99 on SUA. |
| 6.2.1.1 | Monthly and annual reports | Continuous | MSC | | | Ongoing | | |

| Maritime Safety Committee (MSC) | | | | | | | | |
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| 6.2.1.2 | Revised guidance relating to the prevention of piracy and armed robbery to reflect emerging trends and behaviour patterns | Continuous | MSC / LEG | | | In progress | | |
| 7.1.2.8 | Guidance on biofouling for recreational craft less than 24 metres in length | 2012 | MSC / MEPC | BLG | DE | | | MEPC 64/11 para 3.6 |
| 7.1.2.15 | Development of a Code for the transport and handling of limited amounts of hazardous and noxious liquid substances in bulk on offshore support vessels | 2013 | MSC / MEPC | BLG | DE | In progress | | |
| 7.1.2.20 (UO) | Development of international measures for minimizing the transfer of invasive aquatic species through biofouling of ships | 2013 | MSC / MEPC | BLG | DE | | | |
| 7.2.1.1 | Bi-annual MSC circulars on designation of maritime assistance services (MAS) | Annual | MSC | NAV | | Ongoing | | |
| 7.2.2.1 | [Moved to post-biennial agenda] | Continuous | MSC | | | Postponed | | MSC 91 decided to move the output to the post-biennial agenda; BLG 3/18, paragraph 15.7 |
| 7.2.2.2 | Environmental aspects of alternative tanker designs | Continuous | MSC / MEPC | BLG | DE | | | |

| Maritime Safety Committee (MSC) | | | | | | | | |
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| 8.0.2.5 | Reports and information on illegal migrants | Continuous | MSC / FAL | Secretariat | | Ongoing | | |
| 8.0.3.2 | Electronic access to, or electronic versions of, certificates and documents required to be carried on ships | 2013 | FAL | MSC / MEPC / LEG | LEG | In progress | | No issues referred to LEG 99 by other IMO organs or Member States |
| 8.0.4.3 | First half of the stakeholders' consultation completed, second half ongoing; analysis of the responses (i.e. identification and assessment of administrative requirements in mandatory IMO instruments that are perceived as being a burden) ongoing | 2013 | Council | MSC / MEPC / FAL / LEG / TCC | BLG / COMSAR / DE / DSC / FP / FSI / NAV / SLF / STW / Secretariat | In progress | | |
| 10.0.1.1 | Implementation of goal-based new ship construction standards for tankers and bulk carriers | Continuous | MSC | | | Ongoing | | |
| 10.0.1.2 | Development of goal-based ship construction standards for all types of ships, including safety, security and protection of the marine environment | 2013 | MSC / MEPC | | | In progress | | MSC 90/28, section 5 |

| Maritime Safety Committee (MSC) | | | | | | | | |
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| **Planned output number in the High-level Action Plan for 2012-2013*** | **Description** | **Target completion year** | **Parent organ(s)** | **Coordinating organ(s)** | **Associated organ(s)** | **Status of output for Year 1** | **Status of output for Year 2** | **References** |
| 11.1.1.1 | Permanent analysis, demonstration and promotion of the linkage between a safe, secure, efficient and environmentally friendly maritime transport infrastructure, the development of global trade and the world economy and the achievement of the MDGs | Continuous | Assembly | Council | MSC / MEPC / FAL / LEG / TCC / Secretariat | Ongoing | | |
| 12.1.1.1 | Revised FSA guidelines | 2012 | MSC | | | In progress | | MSC 90/28, paragraph 19.17 |
| 12.1.1.2 | FSA Experts' Group established to review FSA studies | Continuous | MSC | | | In progress | | MSC 90/28, paragraphs 19.20, 19.21 and 25.50 |
| 12.1.2.1 | Collection and analysis of casualty and PSC data to identify trends and develop knowledge and risk-based recommendations | Continuous | MSC | FSI | | Ongoing | | |
| 12.2.1.1 | Guidelines and associated training to assist companies and seafarers in improving the implementation of the ISM Code | 2012 | MSC / MEPC | STW | | In progress | | JWGHE as coordinating organ |
| 12.2.1.2 | Revised guidelines for Administrations (resolution A.913(22)) to make them more effective and user-friendly | 2012 | MSC / MEPC | STW | | In progress | | JWGHE as coordinating organ |
| 12.2.1.3 | Enhancing the efficiency and user-friendliness of ISM Code | 2013 | MSC / MEPC | STW | | In progress | | JWGHE as coordinating organ |

| Maritime Safety Committee (MSC) | | | | | | | | |
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| 12.3.1.1 | Guidance on the development of GISIS and on access to information | Continuous | MSC / MEPC | FSI | | Ongoing | | |
| 12.3.1.2 | PSC data collected and disseminated in cooperation with PSC regimes | Annual | MSC | FSI | | Ongoing | | |
| 12.3.1.3 | Consideration of reports of incidents involving dangerous goods or marine pollutants in packaged form on board ships or in port areas | Continuous | MSC / MEPC | DSC | FSI | Ongoing | | |
| 13.0.2.2 | Databases as part of GISIS and other means, including electronic ones | Continuous | MSC/MEPC/ FAL/LEG/TCC | Secretariat | | Ongoing | | |

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# ANNEX 40

## STATEMENTS BY DELEGATIONS AND OBSERVERS[1]

### ITEM 1

### Statement by the delegation of the United Kingdom

"I have been requested by Her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland to make a formal statement to the Maritime Safety Committee concerning ships flying the flag of the UK ship register and ships flying the flag of the British Overseas Territories and Crown Dependencies entering the ports of the Republic of Argentina.

Her Majesty's Government notes that vessels linked to hydrocarbons related activities in the Falkland Islands are the subject of provincial laws that purport to ban them from entering Argentine ports. The United Kingdom wholly rejects the basis of these measures, which are designed to damage the economy of the Falkland Islands.

However, it has also become apparent to the United Kingdom Government that these provincial laws are being applied by certain Trade Unions to British ships that are not linked in any way with hydrocarbons related activities. In one case the action by the Argentine Trade Unions prevented the importation of equipment bound for the nationalized energy supplier YPF and in another case prevented the export of grain from an Argentine farming cooperative. In neither case had the vessel involved called at the Falkland Islands. Significant costs were incurred by the companies involved. Her Majesty's Government has made formal protests to the Government of Argentina on both the union action and the passing of the provincial legislation.

Whilst the interference in the legitimate commercial activities of such ships in Argentina is wholly unjustified, the Government of the United Kingdom of Great Britain and Northern Ireland also has grave concerns for the health and safety of the Master and Crew operating the ships in Argentine ports, mindful of the need to ensure that ships are operated safely and that pollution from shipping is avoided.

I regret to notify the Committee that this interference in Argentine ports has included the denial of certain essential services to ships and crew, including the provision of fresh water supplies and access to port and stevedore services. Ultimately this equates to an Argentine port worker taking political action against a fellow seafarer, both of whom through their national bodies are members of the same international union, the ITF.

We also have grave concerns over reports of threats from the protest group Quebracho that they will block entry to Argentine ports by cruise ships that have called at or plan to call at the Falkland Islands. Such action would constitute a further threat to the safety of workers connected to the shipping industry and cruise ship passengers. We already have reports of one ship changing its itinerary in response to these unreasonable threats.

[1] Statements have been included in this annex in the order in which they were given, sorted by agenda items, and in the language of submission (including translation into any other language if such translation was provided).

In order to ensure that the welfare of all nationalities of seafarers serving on board British Ships, cruise ship passengers, and the safe operation of British ships in Argentine ports, Her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland would like to invite the Government of Argentina through Her Excellency Alicia Castro the Ambassador of the Republic of Argentina to the Court of St James to work with the Foreign and Commonwealth Office to restore the excellent services that British Ships have enjoyed for many years when visiting Argentine ports."

**Statement by the delegation of Argentina**

"La República Argentina no ha incurrido en violación alguna de sus compromisos internacionales asumidos en el marco de las Convenciones de la OMI ni de la normativa derivada de ella.
Tanto la legislación nacional como provincial en materia de navegación en general, y lo atinente al ingreso a puertos argentinos en particular, resulta en un todo compatible con las disposiciones de la CONVEMAR y de la normativa OMI relativa a la seguridad de la navegación y operación de instalaciones portuarias.

Las legislaciones provinciales aludidas por el Reino Unido, que regulan la navegación de cabotaje entre el territorio continental argentino y las Islas Malvinas, tienen por objeto proteger los recursos naturales bajo su soberanía y jurisdicción y rechazar las ilegítimas actividades de exploración y explotación de hidrocarburos desarrolladas en la plataforma continental argentina.
Toda actividad hidrocarburífera en la plataforma continental argentina que no haya sido autorizada por el Estado argentino es ilegal, siendo pasible de sanciones administrativas, civiles y penales.

Desde el mismo momento en que el Reino Unido pretendió, a principios de la década de 1990, promover y autorizar la realización de actividades de exploración de hidrocarburos en áreas de la plataforma continental argentina, el Gobierno argentino ha protestado y rechazado en forma permanente y reiterada tal pretensión británica.

Se recuerda que las Islas Malvinas, Georgias del Sur y Sandwich del Sur y los espacios marítimos circundantes forman parte integrante del territorio nacional argentino y, hallándose bajo ilegítima ocupación británica, son objeto de una disputa de soberanía reconocida por las Resoluciones N° 2065 (XX), 3160 (XVIII), 31/49, 37/9, 38/12, 39/6, 40/21, 41/40, 42/19 y 43/25 de la Asamblea General de las Naciones Unidas, así como por las resoluciones que anualmente adopta el Comité Especial de Descolonización de dicho organismo, que convocan a las dos partes en la controversia —es decir, a la República Argentina y al Reino Unido— a reanudar las negociaciones sobre soberanía a fin de alcanzar una solución justa, pacífica y definitiva de la misma, teniendo debidamente en cuenta los intereses de los habitantes de las Islas Malvinas. El Reino Unido se niega a reanudar estas negociaciones de soberanía, desestimando así los numerosos pronunciamientos de la comunidad internacional en tal sentido.

La pretensión británica de autorizar y realizar actividades de exploración y explotación de hidrocarburos es manifiestamente contraria, en particular, a la Resolución 31/49 de la Asamblea General de las Naciones Unidas, que requiere que ambas partes se abstengan de adoptar decisiones que entrañen la introducción de modificaciones unilaterales en la situación de las Islas mientras se encuentre pendiente de solución la controversia de soberanía entre los dos países.

La pretensión del Reino Unido ha sido, además, objetada por los países miembros del MERCOSUR y sus Estados asociados, la Unión de Naciones Suramericanas (UNASUR), la

Comunidad de Estados Latinoamericanos y Caribeños (CELAC), la Alianza Bolivariana para los Pueblos de Nuestra América (ALBA), la Cumbre Iberoamericana, la Cumbre de Países de América del Sur y de Países rabes (ASPA) y el G77 más China. Asimismo, los países miembros de MERCOSUR y sus Estados asociados y de la UNASUR han asumido compromisos concretos orientados a desalentar las ilícitas actividades antedichas.
En relación a los hechos puntuales mencionados acá por la Delegación del Reino Unido, queremos señalar:

No hay evidencia alguna en la Autoridad marítima argentina de que la seguridad de la navegación o de los buques haya estado comprometida. Ningún buque inició por este tema un pedido de asistencia en el marco de las recomendaciones y mecanismos de la OMI.
En particular, en el caso del buque CLARE mencionado, que efectuó un pedido de rutina de víveres y agua embotellada, éste fue autorizado el mismo día por el servicio de guardacosta y la entrega sufrió una demora de 4 días debido a malas condiciones metereológicas. En ningún momento el buque sufrió falta de agua ya que contaba con una planta potabilizadora en servicio. La Delegación argentina pone a disposición de la Secretaría la documentación sobre este caso para consulta de las delegaciones. Se constata en esta documentación de la Prefectura Naval Argentina, que el puerto de Quequén el día 12 de octubre estaba cerrado por condiciones hidrometeorológicas para todo tipo de buques.

Con respecto a la alusión de la Delegación británica acerca de acciones llevadas a cabo por la organización llamada Quebracho el día 19 de noviembre en las oficinas de una agencia marítima en Buenos Aires, la policía federal argentina procedió a labrar el sumario correspondiente, dando intervención a la justicia correccional de la Ciudad de Buenos Aires. Se trata del sumario número 3057/12 comisaria 15.

Respecto de las medidas de acción gremial a las que hace referencia la representante del Reino Unido, presuntamente realizadas por sindicatos afiliados a la Federación Internacional de Trabajadores del Transporte (ITF), debo destacar que mi país respeta la autonomía sindical. Es de nuestro conocimiento y de la Organización Marítima Internacional (OMI) que las actividades de los sindicatos marítimos afiliados a la ITF, en el marco de la campaña contra las banderas de conveniencia, está destinada a asegurar las condiciones de salud y seguridad de los trabajadores marítimos y la vigencia de convenios colectivos de trabajo. Esta campaña que tiene ya 50 años de antigüedad y ha prestigiado al sindicalismo internacional, ha logrado impedir exitosamente la esclavitud y la explotación de los trabajadores marítimos en el mundo entero.

Finalmente, lamentamos que el Gobierno del Reino Unido haya utilizado a la OMI para realizar sin fundamentos planteos propios que hacen a su relación bilateral con la República Argentina e involucrar la controversia de soberanía que ambos países mantienen sobre las Islas Malvinas, Georgias del Sur, Sándwich del Sur y los espacios marítimos circundantes, y sobre la cual el Gobierno británico se niega a reanudar negociaciones como lo exigen las Naciones Unidas y la comunidad internacional.

Dado que la delegada del Reino Unido aludió a esta Embajadora,esta Embajadora le responde que mi país reitera al Reino Unido la invitación al diálogo."

ENGLISH VERSION

The Argentine Republic has not breached any of its international commitments undertaken within the framework of IMO Conventions or any related regulations.

Both national and provincial shipping-related legislation in general terms, and entering Argentine ports in particular, are in accordance with the provisions of the UN Convention on the Law of the Sea and IMO instruments related to the safety of shipping and port facility operations.

The provincial legislations referred to by the United Kingdom, regulating domestic shipping between Argentine mainland and the Malvinas Islands, are aimed at protecting the natural resources under its sovereignty and jurisdiction, and rejecting the illegal hydrocarbon-related exploration and exploitation activities carried out on the Argentine continental platform.
All hydrocarbon-related activities on the Argentine continental shelf that have not been authorized by the Argentine government are illegal, subject to administrative, civil and criminal sanctions.

From the very moment in which the United Kingdom decided, at the beginning of the 1990s, to promote and authorize the development of hydrocarbon-related exploration activities in the Argentine continental shelf, the Argentine government has permanently and repeatedly protested and rejected the said British claim.

We would like to remind that the Malvinas, South Georgias and South Sandwich Islands and surrounding maritime spaces are part of Argentine national territory and, being under illegal British occupation, are subject to a sovereignty dispute acknowledged by UN General Assembly Resolutions no. 2065 (XX), 3160 (XVIII), 31/49, 37/9, 38/12, 39/6, 40/21, 41/40, 42/19 and 43/25, as well as by the resolutions annually adopted by the UN Special Committee on Decolonization that calls on both parties in this dispute – i.e. the Argentine Republic and the United Kingdom – to resume negotiations on the issue of sovereignty in order to reach a just, peaceful and definite settlement, dully considering the interests of the islanders. The United Kingdom refuses to resume these sovereignty negotiations, thus rejecting the several calls from the international community in this regard.

The British claim of authorising and executing hydrocarbon-related exploration and exploitation activities is manifestly contrary to United Nations General Assembly Resolution no. 31/49 that requests both parties to refrain from taking decisions that would imply the introduction of unilateral amendments to the situations in the Islands in so far as the settlement of the sovereignty dispute is pending between both countries.

The UK claim has been objected by the member countries of MERCOSUR and its associated States, the Union of South American Nations (UNASUR), the Economic Commission for Latin America and the Caribbean (ECLAC), the Bolivarian Alliance for the Americas (ALBA, for its acronym in Spanish), the Ibero-American Summit, the Summit of South American-Arab countries (ASPA, for its acronym in Spanish), and the G77 plus China. Likewise, the member countries of MERCOSUR and its associated states, together with UNASUR, have firmly committed to discourage the aforementioned illegal activities.

Regarding the specific facts mentioned by the Delegation from the United Kingdom, we would like to point out:

There is no evidence among Argentine maritime authorities that the safety of shipping or ships has been jeopardized. In this connection, no ship has requested assistance within the framework of IMO recommendations and procedures. Specifically in the case of the CLARE vessel, which requested assistance for a routine provision of food and fresh water, the Coastguard Service authorized it on the same day and the delivery was delayed by 4 days due to very poor weather conditions. The ship did not suffer from a lack of water as it had an operating water treatment plant. The Argentine Delegation offers the Secretariat documentation about this case for consultation by delegations. As recorded in documentation from the Argentine Coast Guard, on 12 October the port of Quequén was closed to all ships owing to the existing hydrometeorological conditions.

As regards the reference made by the UK Delegation about the actions carried out by the so called Quebracho group at the Buenos Aires offices of a shipping agency on 19 November, the Argentine Federal Police has followed the corresponding legal proceedings, with the intervention of the Magistrate Courts of the City of Buenos Aires. It has been recorded under file report no. 3057/12, Police Station 15.

In connection with trade union measures that the representative from the United Kingdom mentions, allegedly carried out by union members of the International

Transport Workers' Federation (ITF), I shall highlight that my country respects trade union autonomy. We are aware, as is also well known by the International Maritime Organization (IMO), that the activities by maritime union members of the ITF, within the framework of the campaign against flags of convenience, are aimed at ensuring the health and safety conditions of seafarers and the enforcement of labour agreements. This 50-year-old campaign has credited international unions, and has successfully prevented slavery and the exploitation of seafarers worldwide.

Finally, we regret that the United Kingdom has used the IMO to make groundless claims that have to do with its bilateral relation with the Argentine Republic and involve the sovereignty dispute that both countries hold over the Malvinas, South Georgias and South Sandwich Islands as well as the surrounding maritime spaces, and about which the government of the United Kingdom refuses to resume negotiations as the United Nations and the international community demand.

Given that the Delegate from the United Kingdom has referred to this Ambassador, I would like to answer that my country reiterates its invitation to dialogue to the United Kingdom.

## Statement by the delegation of the Ukraine

"On 28 October 2011 a tragedy happened in the South China Sea: at six minutes past midnight a container ship **Taroko** under Liberian flag was hit by small coast freighter **Dershing** 15 miles away from Peng Hu Island. As a result **Dershing** sunk with fatalities. Two officers from **Taroko**, one Ukrainian and one citizen of Myanmar, were ordered to stay on Peng Hu Island until end of an investigation. It took more than a year when officers were released this month.

It is hard to imagine immense psychological and mental pressure two seafarers and their families experienced during this year. I would take this opportunity, Mr. Chairman, to express, on behalf of the Government of Ukraine, deepest gratitude to the International Chamber of Shipping, International Shipping Federation, International Transport Workers' Federation, Liberia Maritime Authority and personally to Douglas B. Stevenson, Director of the Center for Seafarers' Rights, The Seamen's Church Institute, and Peter Hinchliffe, ICS Secretary-General, for their immense efforts to secure release of two officers. I am also grateful H.E. IMO Secretary-General Koji Sekimizu for his interest in this issue, specifically: for the wellbeing of the seafarers.

But also, Mr. Chairman, this story is a grim reminder of criminalization of seafarers, the world shipping community is faced with, yet another call for action to give full effect to instruments for protecting seafarers' rights which were developed by this Organization."

**ITEM 5**

**Statement by the delegation of Greece**

"Greece would like to clarify its position on the important issue on the use and application of these guidelines which are under development. We do agree that the applicability should be as described in document MSC 86/5/3 itself, namely in paragraph 1.3.1 and as further clarified by Requirements D (Applied Rules and guidance) of table 2 in page 25 of the same document. In this regard, you may notice that these guidelines are intended mostly for novel or limited history applications.

Recalling the debate during last MSC that is contained in paragraph 5.11 of the report (document MSC 90/28) we further note, that the above is the main reason of concern for some Member States and the subject of numerous submissions since 2005 which have effectively delayed the progress of the Safety Level Approach methodology. We stressed during last MSC and we would like to reiterate that the concept introduces some further difficulties of: 1) evaluating the current risk (or safety) level of the current rule requirement (so that it can be compared with the proposed alternative); and 2) producing new appropriate evaluation criteria. Noting the quality of risk analysis work demonstrated so far, these two major complications still exist and raise concerns.

Greece has supported the concepts and use of risk-based techniques and analysis with only one provision: that they are applied appropriately and the analysis is correct, reliable and transparent. The conclusion from the results until now is that the risk analysis, like the one is used in FSA, is still insufficient. There are quite a lot of serious issues to be addressed before risk-based design is extensively used to replace the existing and tested prescriptive requirements which have already served the safety of shipping so well, by providing a constant and dramatic long term reduction in accidents, casualties and any kind of defects. The replacement of such existing regulations, especially the ones concerning ships' structures, could be done in the future, gradually and carefully, after the determination of the safety level of rule requirement to be replaced, development of appropriate evaluation criteria, benchmarking with the current rules and after specific review and approval of the relevant IMO Committees are set. For ships' structures, this involves some huge future work requiring major projects, unless someone turns to myriads of 'assumptions' which is not acceptable.

It is obvious that no one wants to come up with the possibility to bypass proven and tested regulations and, of course, no one wants to have problems and misunderstandings among Administrations, (e.g. in case of Flag change), Recognized Organizations or Port States.

We strongly believe that a cautious approach shall be followed by limiting now the application of the guidelines to the approval of novel designs and novel applications only and re-examine the issue as soon as more experience is gained by the Administrations and the problems already mentioned are adequately addressed and dealt with."

**ITEM 6**

**Statement by the delegation of the Islamic Republic of Iran**

"As we all know, for the Long Range Identification and Tracking System (LRIT), it is necessary to set up a so called polygon by Contracting Governments to SOLAS 74 Convention in order to transmit the information needed under paragraph 5, regulation 19-1 of chapter V. As we observed at the previous meetings of MSC, setting up polygon by some

Contracting Governments raised some controversial issues, as one polygon considered overlapping the other set up by the neighbouring states. This delegation would like to bring to the attention of MSC Committee that the polygon established by the Government of Azerbaijan in the Caspian Sea currently overlaps the polygon introduced by the Government of the Islamic Republic of Iran.

In this regard, during the current meeting of MSC, we had an opportunity to meet our friends of Azerbaijan's delegation to raise the concern. The head of Azerbaijan's delegation expressed that they are fully aware of the provisions of regulation 19-1 of chapter V of the said Convention with regard to LRIT and mentioned that the polygon set up is just for technical purposes and is not intended to establish any kind of legal practice or regime to which the negotiations are underway amongst the littoral States. Both sides emphasized that the best way for removing ambiguities, concerns and to find out a solution is to get close contact with each other in the near future."

**Statement by the delegation of Azerbaijan**

"With regard to the statement made by the Islamic Republic of Iran I would like to mention that attention should be made to the Appendix 2 caveats to be posted on the LRIT Data Distribution Plan of the MSC Circular MSC.1/Circ.1298 dated 8 December 2008 on Guidance on the implementation of the LRIT system which clearly identifies the followings: The geographical information provided in the LRIT Data Distribution Plan are unilateral declarations of the Contracting Governments to the Convention (Contracting Governments) concerned and have been entered or uploaded by Contracting Governments themselves or have been entered or uploaded by the Secretariat on the expressed request of the Contracting Government concerned.

The geographical information so provided does not imply any right or obligation of individual Contracting Government other than for the sole purpose of complying with provisions of regulation V/19-1 of the Convention. Their use by the LRIT system does not constitute any form of recognition or acceptance by the other Contracting Governments. The geographical information provided shall not be interpreted or considered as supporting or prejudicing the position of Contracting Governments in relation to land or maritime claims or land or maritime sovereignty disputes.

The Contracting Governments have further agreed that none of the data or information provided in relation to the geographical areas defined in the LRIT Data Distribution Plan shall prejudice the rights, jurisdiction or obligations of States under international law, in particular relating to, the continental shelf, the legal regimes of the high seas, the exclusive economic zone, the contiguous zone, the territorial seas, internal waters or the straits used for international navigation and archipelagic sea lanes.

Bearing in mind all above mentioned and considering the fact that nowadays we don't have any agreement between littoral Caspian States we can only refer to the Treaty of Establishment, Commerce and Navigation which was made in 1935 between the Soviet Union and Iran in respect to boundaries. And we set coordinates for our LRIT system as it was agreed before. Apart of this, it has to be mentioned that this matter does not pursue any political aims and intention of the Republic of Azerbaijan in respect to this issue is only to provide safety of navigation in the Caspian Sea and any help which could be required by the ships in appropriate area.

However, during this session we had an opportunity to meet respective delegation of Islamic Republic of Iran and we came the point for amicable solution of raised matter."

**ITEM 10**

**Statement by Cyprus**

"During the development of III and the RO Codes, Cyprus and a number of other Member States have voiced concerns over certain provisions of both Codes.

With apologies, Mr. Chairman, at this stage, we have not yet been able to complete the relevant examinations at national level. As Cyprus has been amongst the Member States which have supported the adoption of the two Codes and making them mandatory, we do not want to stop the Committee from making progress. However, in the interest of transparency, we feel obliged to advise the Committee that we may have to revert at a later stage on those provisions. Although the action point before the Committee is action point .11 , we have commented also in relation to the RO Code, which is addressed under action point .21. When the Committee get to action point .21, this statement should be taken as read in respect to that action point.

Whilst considering the action requested under action point .11, Cyprus has made a statement and a number of Member States have associated themselves with that statement. Our previous statement has, to some degree, a bearing on the action requested under action point .15. At this stage, we understand that the action requested is to approve the proposed amendments to SOLAS 1974, LL 66, LL PROT 1988, COLREG 1972 and TONNAGE 1969 for circulation with a view to adoption at a future date.

Cyprus continues to support making the III and RO Codes mandatory. However, in the interest of transparency, we feel obliged to advise the Committee that, as we have done through our previous statement, we may have to revert at a later stage on those provisions. Although the action point before the Committee is action point .15, we have commented also in relation to the RO Code, which is addressed under action point .22. When you come, Mr. Chairman, to action point .22, this statement should be taken as read in respect to that action point."

**Statement by the delegation of the United States**

"The United States congratulates the Committee on successfully charting the course to agree to a system to provide for periodic audits that will assess a contracting government's consistency with the audit standard with respect to the implementation of relevant IMO instruments. The United States believes that this system, particularly where a contracting government develops a programme of actions in response to audit findings, will enhance the effective and efficient implementation of applicable IMO instruments. The assistance of the Secretary General in the administration of this new audit scheme will be helpful.

We continue to support the provision for mandatory audits using the III Code provisions as benchmarks for auditing the implementation of the relevant IMO instruments. We have closely reviewed the text of the current draft amendments to the IMO instruments and believe that it could be improved prior to adoption by more clearly reflecting the scope and purpose of the audit.

Specifically, the audit standards are intended as benchmarks that are to be used when conducting mandatory audits of governments' implementation of the relevant mandatory IMO instruments; the audit standards themselves are not, however, intended to constitute legal obligations, and we think the text of the amendments should reflect this intention. Similarly,

the role of the auditors is to assess the consistency of a government's implementation efforts with the audit standards. Revisions along these lines would better reflect what we understand is the shared intent for this audit regime and enable us to give the proposed amendments our support.
We continue to enthusiastically support the work to establish the mandatory audit regime and believe our comments reflect what we understand to be a shared idea how the mandatory audits will work."

**ITEM 12**

## Statement by the observer from ICS

"ICS welcomes the above information provided by the Secretariat and the efforts made by IMO, IHO and others to resolve the issue of ECDIS anomalies.

We note, however, that the information on the IHO website, referenced in this submission shows no available information for 19 out of 29 IHO known ECDIS manufacturers. It is therefore questioned how, when urged by the IMO Secretariat, 'shipowners managers and ships can use the information provided to ensure that their ECDIS systems are updated to meet the latest applicable standards'?

ICS additionally notes that an IHO report of a subsequent meeting on this matter casts a rather less optimistic light on the current situation, with even 'new fit' ECDIS than is reported by the Secretariat. The IHO report notes that regarding, 'New fit systems, it was reported that 80% of systems show all the required underwater obstructions but that they do not all necessarily show them in the same way. 20% do not show some of the underwater obstructions in the standard display mode'.

The simple implication of this IHO report is that 20% of new ECDIS built and type approved to the latest standards (resolution MSC.232(82)) do not show all the required underwater obstructions! Amongst the 80% that do show all the required underwater obstructions there is even variety in how these obstructions are displayed.

ICS has serious concern regarding this latest information from IHO that appears to have serious implications for the safety of navigation and requests that the Committee urgently considers what appropriate action should be taken."

## Statement by the observer from IHO

"In order to assist you and in order to allay some of the concerns expressed by distinguished delegates, we would like to make the following points.

Any ECDIS installed after 2007, intended to meet the carriage requirements requires no technical intervention. Some ECDIS purchased before 2007, which is when this Organization adopted the latest performance standard for ECDIS, may require a software upgrade in order to work optimally. If the software is not upgraded, the equipment can still be used for navigation without any safety implications by the means of workarounds.

The 19 manufacturers for which software information is provided on the IHO website represent by far the most in use at sea today. In fact, the IHO has not received a single report from sea related to the 10 systems for which no information is posted.

I would like to reiterate the statement made by my colleague - the IHO is unaware of any ECDIS in use at sea that cannot be used to meet the carriage requirements - not withstanding that a limited number require a software upgrade in order to work optimally."

**ITEM 17**

**Statement by the delegation of Greece**

"Piracy off the coast of Somalia has declined in recent months, but attacks in West Africa are reaching dangerous proportions. By quoting of what the IMB director has recently stated 'Pirates are getting quite audacious, with increasing levels of violence being used,' it is pointed out that recent attacks in the region illustrate a worrying and new development for the flag States as well as for the shipping industry.

Despite, the number of ships signalling attacks by Somali pirates has fallen this year to its lowest since 2009, IMB warns seafarers to remain vigilant in the high-risk waters around Somalia, the Gulf of Aden and the Red Sea. Meanwhile, violent attacks and hijackings are spreading in the Gulf of Guinea. Piracy in the Gulf of Guinea is becoming increasingly dangerous and has pushed westward from Benin to neighbouring Togo.

Unlike Somali pirates, who focus on the ransom of captured crew members, armed robbers in the Gulf of Guinea derive much of their income from the theft of oil.

Due to the fact that armed robbers derive their profits from the sale of oil and other goods rather than the ransoming of hostages, pirates in the Gulf of Guinea have also proven to be significantly more violent than their Somali counterparts. Vessels are frequently sprayed with automatic weapons fire, and the murder of crew members is not uncommon.

Greece, as one of the Flag States affected by armed robbery in the area, strongly believes that Flag States, Coast States, International Organizations as well as the international shipping industry itself must react following policies and implementing strategies to counterpart this phenomenon.

Regional and international actors can look to the Strait of Malacca, where a number of nations coordinated joint counter-piracy operations and shared intelligence, for an example of successful cooperative efforts to curtail piracy. Increased logistical, material, and intelligence support from international partners will be vital to these efforts. International and regional actors have an opportunity to address the growing threat of piracy in the Gulf of Guinea, but only if they act together.

In this context, we do consider that additional measures as well as technical assistance should be provided to West African coastal states to counterpart piracy off their coasts."

**Statement by the observer from ICS**

"The decrease in successful attacks by Somali based pirates, reported in MSC 91/17, is a testament to the success of the international community in suppressing piracy in the region. Whilst there can be no room for complacency, and BMP compliance and military deployment must remain a constant for some time to come, it is hoped that these most recent figures signify the start of a general downward trend in the fortunes of Somali Pirate Action Groups.

However, as Singapore, Greece and others stated earlier, it is disappointing and deeply worrying, that this progress in the Indian Ocean should be countered by a startling rise in attacks against ships on the other side of the African continent.

Whilst the characteristics of West African piracy differ from its Somali counterpart, it has the potential for a similar impact, constricting trade flows and energy supplies and severely affecting the safety and wellbeing of seafarers. ICS believes it is imperative that a stand is taken against these criminals now.

Many lessons have been learnt from the experience of Somalia based piracy, but they may not all be applicable in the context of West Africa. The motives and model used by pirates in the Gulf of Guinea differ from their East African counterparts. Similarly, the existence of stable States in the region, whilst offering the possibility of swift justice for these criminals, also creates difficulties, as corrective and defensive mechanisms that work in the lawless waters off Somalia may not be feasible in a region where the rule of law exists. In this, a parallel may be drawn with South East Asian Piracy, and the experience and success of the ReCAAP initiative may therefore be of assistance in developing an appropriate model to combat this crime.

The counter piracy exercises and task force described by Nigeria is welcome, and it is hoped that such actions will dent both the success and audacity of the criminals who currently enjoy such apparent freedom in attacking vessels in these waters. However, given the complex nature of the crime, broader multilateral action will be required, involving cooperation between littoral States and the engagement of the IMO, industry, flag States and relevant military expertise.

ICS calls on the littoral States of the region under the auspices of the Organization, to cooperate and work with industry, flag States and other affected parties, to find a regional solution to the blight of piracy off West Africa so that ships and their crews can return to conducting their business in a safe and secure environment."

## Statement by the delegation of India

"The Indian delegation, while appreciating the significant drop in incidents of piracy due to all the efforts of international community, would however, like to reiterate the continued plight of those innocent seafarers that are still held captive by the Somali pirates.

Sir, among those held captive, are 24 crew of Iceberg – I who have been held for over 968 days, 7 seafarers of ex-**MT Asphalt** venture who have been held for 788 days and 16 seafarers of **MT Albedo**, held for over 700 days, as on date.

More regretfully, Mr Chairman, in spite of all the work being done by this Organization and also by several other agencies, there does not appear to any concentrated strategy for seeking release of those held in captivity, other than keeping it within the realm of the concerned ship-owners, who, in the cited cases, are not showing any interest in negotiating the release of seafarers.

Mr. Chairman, families of these innocent seafarers are looking up to you, this esteem organization and the distinguished delegates representing the flag administrations of ships which continue to be held by Somali pirates, to consider the continued plight of their loved ones and evolve concrete measures for their expeditious release."

**Statement by the delegation of the Bolivarian Republic of Venezuela**

"La República Bolivariana de Venezuela agradece a la Secretaria y a las organizaciones que se han abocado a trabajar en este delicado tema, y realizáremos nuestra declaración de carácter general, asimismo, reconoce la necesidad de que se adopten medidas conducentes a combatir la piratería, cuyo concepto es aceptado a nivel internacional y definido por diversos instrumentos los cuales lo limitan solo al uso de este término a todos aquellos actos acaecidos en "lugares no sometidos a la jurisdicción de ningún Estados", es decir, en aguas internacionales o altamar. Considerando lo antes expuesto, Venezuela reconoce que mediante el fortalecimiento de la cooperación y la solidaridad entre los Estados Miembros de la OMI, se puede continuar con la erradicación del flagelo de la piratería. Sin embargo, es bien conocida la Posición de Venezuela en lo particular del riesgo en el uso de personal privado armado abordo e insistimos ante la misma en este plenario, ya que estaría desconociéndose en cierta medida a nuestro parecer el derecho soberano de los Estados ribereños al ejercer control pleno sobre sus espacios acuáticos; y a su vez encomendándose a terceros la seguridad de estos espacios; aspecto este que según la constitución y las leyes del Estado Venezolano no es aceptable.

ahora bien ya entrando en la materia presentada, se observa con preocupación lo referente a la diferenciación indiscriminada por parte de hasta Organizaciones Reconocidas en la OMI entre que un hecho sea de Piratería, Robo Armado o hasta delito común, evidenciado la necesidad de unificar estos criterios para su reportes a fin de buscar la precisión y objetividad de los indicadores a obtener que sin lugar a duda redundara en la eficiencia de nuestras decisiones !!!!

Por todo lo antes expuesto, solicito que se registre en acta nuestra declaración al respecto y Finalmente, pedimos mucha cautela en la materia, y expresamos nuestro compromiso como Estado soberano, de sumar nuestros esfuerzos a los de la comunidad internacional, a fin de continuar trabajando en la búsqueda de soluciones definitivas para la completa erradicación de la piratería, basándonos en los principios internacionales de justa equidad, solidaridad, autodeterminación de los pueblos, y respecto a la soberanía e integridad de los Estados."

**Statement by the delegation of Turkey**

"In accordance with Turkey's maritime security policy, supporting the efforts of IMO, Turkish navy is conducting counter-piracy operations in gulf of Aden and Somalia basin since the very beginning. In this context, Turkey is assigning a frigate with a special force team to SNMG-2 and CTF-151 on a rotational basis and at this moment, one Turkish admiral is assuming the command of CTF-151 until the end of December 2012.

Turkey's efforts are not limited to assignment of naval units. During MSC 90's working group session we informed distinguished delegates regarding Turkey's decision to establish a multi-national maritime security excellence centre in Aksaz naval base located in Marmaris. The centre has been activated as of 12 November 2012 internationally with the participation of different countries and so far; Italy, Kazakstan and Georgia declared their commitments to provide expert personnel officially. Now I would like to summarize the first activities of the centre.

We conducted "maritime security workshop" on 15-16 November with the participation of 24 members from 6 countries including USA, France, United Kingdom, Norway, Nepal and Somalia. Following this workshop, "maritime security and counter piracy course" took place from 12 to 23 November with the participation of members from 18 countries. At the moment, the centre is participating in exercise dynamic master through naval co-operation and guidance for shipping (NCAGS)/Marmaris until 29 November with the participation of staff personnel from Poland, Netherlands, Belgium and Turkey.

As for the planned activities of the centre: In April 2013, vessel protection detachment training, in June counter-improvised explosive device (C-IED) and in July ISPS Code courses will be conducted.

More information about the training program for the next three years can be found in COE's web-site (www.dgmm.tsk.tr). Republic of Turkey is looking forward to working together with all the countries under the Marsec COE umbrella to promote security in the maritime domain for the good of all."

**ITEM 19**

**Statement by the delegation of the Cook Islands**

"As expressed at the 109th session of the Council we have some concern with respect to the consideration being given to the Review and Reform of the Organization including the proposals submitted by the IMO Secretary-General under Council Paper C 109/3/1.

We believe that these proposals should be of concern to Member States particularly the developing countries including the SIDS. We believe a number of these proposals risk undermining the famous IMO 'spirit of co-operation' between maritime nations. There is a danger that they could lead to the increased politicization of issues which should primarily be decided on the basis of their technical merits, thus further reducing the quality of current IMO decision making. If these proposals were to be adopted we believe they could have a serious impact on the ability of IMO to conduct its important work with the same degree of openness and thoroughness to which member states , IGO's and NGO's have become accustomed. They may also leave IMO open to the charge of a lack of transparency with respect to how it arrives at its important decisions.

Our prime concern is that the proposals could reduce the ability of IMO to produce regulations and guidelines that reflect genuine consensus amongst the world's maritime nations and take into account the disproportionate impact on SIDS. The strength of the current system is that the extensive and considered debate which it facilitates allows all Member States to feel a strong sense of ownership towards the decisions that are made, even if they do not always reflect the original starting positions of individual governments.

We have genuine doubts about the proposed reorganization of the IMO Committee structure and the plan to increase the number of working groups that can be convened at IMO meetings, especially as the reduction in the number of meetings that will result will apparently be relatively small. This does not mean that we do not recognize that some reorganization of the Committee structure may make sense such as the frequency of meetings.

Our main concerns are the proposals regarding the production of written reports of IMO Committee and Working Group discussions.

In order to have a proper understanding of how decisions are taken within IMO Committees, and in order to allow governments, in particular the smaller delegations to prepare their positions in between meetings, it is of the utmost importance that there is a proper written report of the interventions made by Member States, observers and NGOs. The proposal for the IMO Secretariat to produce only summary reports of decisions taken will be wholly inadequate, and the notion that Member States can listen to verbatim audio recordings of debates over the internet is, in our opinion, simply impractical.

Who amongst you has listened to the 19hrs and 58 minutes Audio of the 109th Council? How many of you from outside the Council recognize this intervention as a general statement given to the Council by the Cook Islands?

The proposal for similar reporting of Working Group discussions within IMO Committee meetings is perhaps of even greater concern. Simple summaries of decisions will not provide Member States, whose responsibility is to make decisions in Plenary sessions of Committee meetings, with any proper appreciation of the arguments made during Working Group debates, or the reasons why some Member States (or observers) may have supported contrary positions, or the strength of feeling of Member States with respect to the various positions put forward on what are often very complicated technical matters.

We are deeply concerned that such an approach will make it far more difficult for Member States in plenary to question Working Group's decisions, when their ability to do so will actually be more important than ever given the likely inability of most, if not all, delegations from the developing countries to attend the expanded number of Working Groups that it has been proposed should be established at Committee meetings.

The Committee will undoubtedly realize that the results of these changes, if adopted, would impact on the quality of IMO decision making and the ability of IMO to make decisions on the basis of genuine consensus that hitherto have been supported by governments and the wider maritime industry .

Chairman, we must not through badly judged initiatives such as these compromise an Organization that thus far has been recognized as being a unique Technical resource within the UN System.

We cannot support proposals that effectively disenfranchise the developing counties and in so doing legitimize the placing of the decision making process into the hands of a minority of member states from the developed world."

**ITEM 21**

**Statement by the observer from ICS**

"During MEPC 64 and in response to MEPC 64/INF.30, ICS made a verbal intervention to the Committee. Due to the date of submission of this INF. paper it was not possible to make a written submission within the deadline to that Committee. In MSC 91/21, ICS has led its industry partners in expressing concern regarding the ROPME submission and particularly with regard to safety issues that fall within the purview of the MSC Committee.

The cosponsors are concerned that some of the information in the ROPME submission differed significantly from the events as monitored by ICS and other associations as they unfolded. ICS is aware that repeated requests to the coastal States represented by ROPME for the casualty to be granted access to a Place of Refuge (POR) were denied and formal permission to access a POR was not granted until 25 June with the ship reaching Asry in Bahrain 3 days later. A period of over one hundred days elapsed from the initial incident to reaching the POR. The co-sponsors are deeply concerned at this excessive response time and questions the apparent failure to fully apply the 'Guidelines On Places of Refuge for Ships in Need of Assistance' (Resolution A.949(23)).

In addition, it is understood that regional and international arrest warrants have been sought for the Master and Chief Engineer of the **Stolt Valor**. It is not apparent what charges are associated with these requested arrest warrants and it therefore appears completely unjustifiable that arrest warrants should be issued.

The shipping industry has serious concerns at this attempted criminalization of the ship's Officers. It is clear that the crew's decision to abandon ship was the correct one; there could certainly have been further loss of life from a subsequent larger explosion that occurred shortly after the evacuation had been completed. There was no need for the crew to remain in Bahrain to assist with the salvage operation as salvors had all of the required information and the immediate need was to fight the fire.

The Committee is urged to consider what additional measures may be appropriate and to stress the need for all States to apply the following IMO and IMO/ILO instruments: 1) Code for the investigation of marine casualties and incidents (resolution A.849(20)); 2) Guidelines on places of refuge for ships in need of assistance (resolution A.949(23)); and 3) The ILO/IMO Guidelines on fair treatment of seafarers in the event of a maritime accident (resolution A.987(24)).

Furthermore, the Committee is urged to consider what further action may be appropriately taken in regard to resolution A.1038(27), High-level Action Plan of the Organization and priorities for the 2012-2013 biennium, and the commitments therein."

**Statement by the observer from ROPME/MEMAC**

"The incident of the **M/T Stolt Valor** took place on the 15th of March 2012 at 0130 Local Time (GMT +3), 40 n. miles off the K. Saudi Arabia Coast. The Marine Emergency Mutual Aid Centre (MEMAC) was authorized by its Member States to follow up and monitor the incident closely right throughout the process of the salvage operation. We would like here to highlight some facts and give further clarification to this Committee, as the ship-owner's organization document has been sent out without any attempt to seek ROPME/MEMAC view or input. We brought this matter to this Committee to share information, exchange experience and learn lessons.

The ship's owner promptly nominated a salvage company, but unfortunately, they were late on arriving to the casualty site as well as on responding to the incident due to many unjustifiable reasons. This could be given upon the completion of the incident case as a lesson learned, if necessary, without harming the reputation of any. The Salvage team arrived at the casualty site on the early morning of the 16th of March and were not able to bring the vessel under control and could not provide any plan for their operation as they were asked continuously and repeatedly by our organization to do so, till the salvage team was replaced on the 28th of March, where the operation was commenced and the operation plan was provided. Also, we have to note that another vessel was engaged for unloading the chemical cargo from the stricken vessel but only on the 11th of April, where it could have taken place much earlier.

Till the 12th of May, the vessel was continuously leaking its chemical cargo of the Methyl Tertiary Butyl Ether (MTBE) and Isobutyraldehyde (IBAL), which are highly toxic and dangerous substances (refer to GESAMP hazard profile), as indicated by the samples taken from the sea water continuously from the ship as well as from the surrounding of its location, which demonstrated that the vessel had leaked its chemicals cargo into the marine environment.

The request of the owner and the flag state for the place of refuge (POR) was studied very carefully and seriously. It was extremely difficult to nominate a POR within the Special Sea Area of our Region with its nature of high sensitive and fragile coastal areas, beside the existence of several intakes, specially the Water Desalination and power plants which feed over 15 million of population with fresh water and power. Evidence for these facts can be given upon request at any time.

The IMO resolution A.949(23) Guideline, which is entirely advisory in its nature, gives some useful advice to the Member States in order to provide assistance to ships in distress situation and therefore to mitigate the risky consequences to the environment and to prevent marine pollution. It is the right of the states to determine, taking into account all the necessary factors, to provide the necessary assistance to the ship and to bring the ship into a place of Refugee if the circumstances permit them to do so. The vessel was under continuous surveillance and monitoring. MEMACs' surveyor also attended the site in order to carry out the assessment, observing the analyses factor of article 3.9 of the resolution and accordingly the best decision was made.

The criticism levelled against our coastal Member States for not allowing immediately a place of refuge has no justification since these States conducted themselves in the best interest of their people. Their action was also in accordance with the guidelines "Decision-making Process for the Use of a Place of Refuge" per the above said resolution. It should be noted that there was no life at stake here – only a vessel with highly toxic cargo on board. The IMO guidelines permit the coastal states to refuse admittance, which is in the sovereign right of the states.

The Member States allocated a safe anchorage position to carry out the salvage operation, but the salvor kept towing the vessel round without any plan. The Salvage team, without observing the applicable International law of innocent passage, entered the maritime boundary of one of our Member States and violated its maritime jurisdiction and its right and also ignored its initial warning to leave its territory, and therefore dispatched its Coast Guard to inform them about the situation and without any means of clashes whatsoever and harass them as this is an unjustified claim of the co-sponsors, requesting them to leave its maritime boundary and to proceed to the allocated position. Furthermore, the area, which the salvor headed to, is known to us of its strong currents and high waves, though we have never exercised any 6 meter high waves within the inner part of the ROPME Sea Area.

For the regional and international arrest part, which came after the request given to the owner for an interview to stand on the facts on the location of the incident as a normal practice and under the warranties of the Master and Chief Engineer to return to their country without any arrest, which is totally rejected, and which is of grave concern.

It is obvious that there was presence of explosive vapours in the tank which was ignited, but the source of the ignition being unknown as of now. The source of ignition may be an important consideration, but more than that it is the consideration of how the explosive vapours came to be present in the tank. Were there any cracks in the side walls of the tank? Was the owner in possession of this knowledge prior to loading the ship? Did the Master or Chief Engineer report about the existence of such cracks to the Owner's Office? Was the inert gas system working at the material time? What was the instruction given to the ill-fated crew member with regard to the tank cleaning operation? Why was he sent out to the deck since the tank-cleaning operation would have normally been carried out from the bridge? Was it the right procedure that the pump man, who lost his life, to carry out the tank cleaning operation without an officer's supervision where the chief officer was reported to be sleeping at the time of this operation?

The Co-sponsors' statement is: 'There was no need for the crew to remain in Bahrain to assist with the salvage operation as the salvors had all of the required information and the immediate need was to fight the fire'. It is unprofessional to argue in this manner since it is reasonable and quite in line with ordinary seaman's prudence that the Master and Chief Engineer of the stricken vessel should remain close to the vessel until the salvage team take over. Also, to send them off immediately before being interviewed suggests some kind of wrong decision-making process and in clear breach to the code for the investigation resolution A.849(20). Furthermore, it is a direct violation of the 'Guidelines for action required of masters and/or salvors of ships in need of a place of refuge' as contained in the IMO Assembly resolution A.949(23).

Finally, ROPME Member States are well aware of all instruments referred to in document MSC 91/21, paragraph 10. And as for the issue of unfair treatment of the seafarers, we request the Committee to communicate with the Philippine Embassy in the Kingdom of Bahrain in order to seek the information about the way the crew of the **Stolt Valor** were treated as they are the ones who can prove that the co-sponsors' document is entirely intended to mix up this issue with the political situation of our region, which is entirely out of the scope of the Committee, and therefore this is not the right place to bring this to the intention of the Committee as whole.

We invite the Committee to consider the information and take action as appropriate."

## Statement by the delegation of Liberia

"During MEPC 64 Liberia also made a verbal intervention in response to MEPC 64/INF.30 submitted by the observer intergovernmental organization ROPME, which provided their summary of the accident and response to the Liberian flagged **Stolt Valor** explosion, fire and tragic loss of life of one seafarer that occurred in March 2012.

We were also concerned that some of the information in the ROPME submission differed significantly from the events that unfolded over the months that followed and it was important to provide additional details on the incident and the response for the record, in particular the lack of a Place of Refuge for ships in distress and in need of assistance.

The relevant details with regard to safety issues that fall within the purview of this Committee have been adequately addressed in the paper and just presented by ICS, so we will not repeat them. Our full statement regarding the response to the incident are in Annex 14 to the MEPC 64 report.

Suffice it to say, the owner, with assistance of their P&I Club took immediate and responsible actions following the incident, engaging local and international experts with knowledge of the region, salvage, fire-fighting and other response resources required to combat the fire, stabilize the damaged vessel and protect the environment. The owner and their experts are to be commended for the successful removal of the remaining cargo, bunkers, lubricants, paints and other environmental hazards without incident or spillage. This despite the fact the **Stolt Valor's** was in a fragile state and being forced to remain at sea, where seas of up to 6 meters where encountered and bow and stern moving independently, increasing the risk of her breaking in two.

We believe it is important that the issues raised in the ICS, et al, paper are further considered by this Committee and MEPC.

Given the importance that IMO placed on the issue of Places of Refuge back in 2000 and the apparent lack of implementation of A.949(23) during the **Stolt Valor** incident, Liberia believes it's time to revisit the issue with the intent to institutionalize the matter of Places of Refuge to ensure timely consideration, cooperation and a clear decision-making by all interested parties."

**Statement by the delegation of the Islamic Republic of Iran**

"We looked into the document MSC 91/21 submitted by ICS, BIMCO, INTERCARGO, IPTA and INTERTANKO. We have also listened carefully to the comprehensive explanation of the representative of ROPME/MEMAC as well as Liberia and Bahrain that gave us a broader picture of what has happened in case of **M/T Stolt Valor** as the incident occurred in waters of our neighbouring countries. This delegation is thankful of all of them.

Frankly speaking, even though we recognize the concerns of the co-sponsors as to the issues raised by them, we can see a number of deficiencies in their submission. Mainly, it suffers from the lack of adequate, transparent and reliable information and evidences.

This delegation would like to associate itself with the statement made by the representative of ROPME/MEMAC and support it in general. We also do appreciate the efforts made by this regional organization.

Most of the points that we wanted to raise, have already been covered in the said statement and therefore, for the interest of time, we don't go further into the details and just reiterate that, this is only the coastal state to decide if the place of refuge can be granted or not, taking into account all circumstances prevailing each case. We think this is the practice of every single state around the world, based upon their sovereignty rights and therefore is not questionable at all.

Another thing that we would like to highlight is the height of the wave. In second sentence of paragraph five of the document submitted by co-sponsors, says that: 'In the circumstances, the salvors were forced to conduct these hazardous operations in the open sea where waves of up to 6 m were experienced causing inevitable delays'. We will be thankful of the co-sponsors, if they let us know from where they obtained such figure. ROPME Sea Area, in particular the Persian Gulf, is a semi closed sea and, in most of the time, is a calm water. For your information, according to the records of two meteorological stations of the region, during second of half of March and entire April, May and June 2012, the maximum recorded wave was between 180 to 240 cm, and it was only for three days in April. During this period, in most times, the wave fell down below one meter and sometimes reached even less than 40 cm.

These points bring us to the conclusion that, some of the ambiguities and perhaps misunderstanding could have been removed by co-sponsors direct access to MEMAC or the member states, before they submit the aforementioned document with some uncertainties and doubts.
At the end Mr Chairman, as far as the Islamic Republic of Iran is concerned, along with ROPME/MEMAC, we are also ready for close cooperation with the flag state of the stricken ship, i.e. Liberia, for any help in sharing the appropriate knowledge and information, despite the full explanation provided by ROPME/MEMAC at this meeting."

**Statement by the delegation of the Republic of Korea**

"This is a report and reminder of caution on GNSS signal reception failure by radio interference. The Republic of Korea would like to report that there was a case of serious threats posed to hinder safe navigation, which was caused by GNSS signal reception failure by radio interference occurred recently in the Yellow Sea off the Republic of Korea.

A device for GNSS reception was recognized as one of the mandatory position-fixing equipment for Worldwide Radio-navigation System (WWRNS). A GNSS reception device has been recognized as useful and mandatory equipment for identifying a ship's position, therefore, GNSS has been recently installed on the majority of vessels.

In addition to the function to identify a ship's position, GNSS has been used for a wide range of navigation equipment, such as AIS and ECDIS. Furthermore, GNSS has been used for assisting emergency operations in conjunction with LRIT and Ship Security Alert System (SSAS). In other words, GNSS is known as one of the most essential equipment for safe navigation.

However, the Government of the Republic of Korea received reports informing that merchant ships and airplanes in the Yellow Sea off the Republic of Korea, specifically in the waters off the Ports of Incheon, Pyeongtaek, and Daesan, had repeatedly failed to receive GNSS signals between some minutes to some hours from 07:49 April 28 to20:47 May 13, 2012. As was stated in document NAV/57/6/2, submitted by the Republic of Korea, such GNSS signal interference had already occurred more than three times in August 2010.

The Yellow Sea off the Republic of Korea where the GNSS signal failure occurred is frequently used as a major route by more than 1,000 vessels a day navigating to and from such countries as the Republic of Korea, Japan, and China. Taking into account the heavy traffic load composed of large oil tankers and cruise ships in the region, it is not unreasonable to expect that GNSS signal interference would lead to serious marine accidents or pollution.

Therefore, the Republic of Korea would like to stress that, in view of the fact that GNSS is one of the most critical navigational systems, all stakeholders should take all the necessary actions to prevent GNSS signal interference that may lead to hamper safe navigation.

The Republic of Korea has a plan to establish and operate e-Loran system, upgraded Loran-C system which is expected to be operated in Korea by 2018, against GNSS signal interference occurred frequently since 2010."

**Statement by the delegation of the Islamic Republic of Iran**

"In line with international community, the Islamic Republic of Iran during past years has had a very integrated co-operation with IMO and other maritime related international organizations to improve maritime safety and pollution prevention at sea. The Islamic Republic of Iran has used all of its potential and actual resources and capacities to achieve IMO and other maritime related international organizations goals in maritime safety, security and pollution prevention such as: 1) Active contribution and constructive co-operation with other Member States to improve maritime rules and standards within IMO and other international organizations; 2) Ratifying 28 IMO legally binding instruments and Maritime Labour Convention (MLC) with highly commitment in implementation as flag, port and coastal state; 3) Volunteering IMO Audit Scheme and using its resources to improve our system to ready for mandatory IMO audit in 2015. It is worth noting that, the result of the Secretariat report on IMO Audit represents the full scale cooperation and commitment of the Islamic Republic of Iran in this regard.

The Islamic Republic of Iran believes that international maritime community will not achieve its goals regarding the improvement of safety, security and pollution prevention unless all related entities such as IMO Member States, non-governmental organizations (NGOs) and shipping industries have close relationship and cooperation at the regional and international levels. Accordingly, we, as an active IMO Member State, have been working and trying for realization of objective collaboration in maritime fields and improving our interactions with other IMO Member States and NGOs.

On behalf of the Government of the Islamic Republic of Iran, I would like to bring to the attention of this Committee that, unfortunately, during the past months due to direct and indirect measures taken by some governments, unfair and undue restrictions have been imposed against Iran's commercial shipping industry. We strongly believe that, these measures undoubtedly would have an adverse impact on regional and international maritime safety, security and pollution prevention and would hamper relevant international co-operation in mentioned areas.

We, for instance, refer to a letter sent by one member of International Association of Classification Societies (IACS), saying that, it is impossible for them to continue providing safety services to Iran in an attempt to avoid consequences resulted from restriction imposed by some Governments on them. Same approach was taken by most of the IACS members for the same reasons. Consequently, as of 1 July 2012, providing safety services to Iranian vessels has been stopped by those classification societies. As a result, providing maritime safety and technical services even to foreign flag vessels within Iranian territorial waters has been stopped.

The Islamic Republic of Iran considers these measures taken by certain Governments, against the international laws particularly principle of "Good faith" and objectives of International Maritime Organization and other IMO major conventions, such as SOLAS and MARPOL.

Mr. Chairman, Secretary General of IMO, distinguished delegates, the Government of the Islamic Republic of Iran, while reserving its right for setting forth the issue to other IMO's relevant entities as per paragraph a, Article 2, as well as Article 3 of the IMO Convention, expresses deep concern over such unfair restrictions and discriminatory actions, nowadays impair the shipping industry as a whole. We strongly believe that, these actions would seriously affect the maritime safety, security and the marine environment of the whole maritime community; something that needs our attention and outmost care of IMO Member States."

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